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**FINAL**  
**ENVIRONMENTAL ASSESSMENT**  
**FOR**  
**WING INFRASTRUCTURE DEVELOPMENT**  
**OUTLOOK (WINDO) PLAN**  
**SHAW AIR FORCE BASE, SOUTH CAROLINA**



**20th Fighter Wing**  
**Air Combat Command**

**October 2004**

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**FINAL**

**FINDING OF NO SIGNIFICANT IMPACT**

**ENVIRONMENTAL ASSESSMENT FOR  
IMPLEMENTATION OF THE WING INFRASTRUCTURE DEVELOPMENT  
OUTLOOK (WINDO) PLAN**

**SHAW AIR FORCE BASE, SOUTH CAROLINA**

**20th Fighter Wing  
Air Combat Command**

**October 2004**

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**ENVIRONMENTAL ASSESSMENT FOR  
IMPLEMENTATION OF THE WING INFRASTRUCTURE DEVELOPMENT OUTLOOK  
(WINDO) PLAN  
SHAW AIR FORCE BASE (AFB), SOUTH CAROLINA**

**AGENCY:** United States Air Force, Shaw Air Force Base, Sumter, South Carolina.

**BACKGROUND:** Pursuant to the National Environmental Policy Act (NEPA), as amended, the Council on Environmental Quality (CEQ) regulations implementing the act (40 CFR 1500-1508), Department of Defense (DoD) Directive 6050.1 [*Environmental Effects in the United States of DoD Actions* (30 July 1979)], and the current version of the Air Force *Environmental Impact Analysis Process (EIAP)* (32 CFR Part 989)] implementing these regulations, the 20th Fighter Wing at Shaw AFB has conducted an *Environmental Assessment for Implementation of the WINDO Plan for Shaw AFB, South Carolina*.

This action is needed to meet major, near-term facilities requirements identified in the WINDO Plan. The purpose of the WINDO is to identify needed facilities and improve the process of facility planning in support of the base missions. It assists in identifying long-term priorities and goals of the base and translating them into facility and infrastructure objectives; optimizing investments in support of the mission requirements of the base; and efficiently using and/or protecting resources. The WINDO ensures that the Wing Commander, Shaw AFB, and Air Combat Command (ACC) have a common set of infrastructure goals and priorities that will enable continued operations at the base. The plan is needed to guide future growth, ensure orderly development of the base over time, and identify opportunities to efficiently support current and new missions so that Shaw AFB remains an essential Air Force installation.

**DESCRIPTION OF PROPOSED ACTION:** The Proposed Action for which this Environmental Assessment (EA) was prepared is the implementation of 17 projects included in the WINDO Plan for Shaw AFB. The implementation of these projects would contribute to performance of the missions of Shaw AFB and its auxiliary facility, Poinsett Electronic Combat Range (ECR), by providing new or improved facilities for ongoing operations, enhancing force protection, or improving the quality of life of base personnel.

**DESCRIPTION OF ALTERNATIVES:** The Air Force EIAP, in compliance with the CEQ regulations, requires that, in addition to the Proposed Action (described above), the No-Action Alternative and other reasonable alternatives be evaluated in the EA. Reasonable alternatives are those that “meet the underlying purpose and need for the proposed action and that would cause a reasonable person to inquire further before choosing a particular course of action” (32 CFR 989). Alternatives may be eliminated from detailed analysis based on operational, technical, or environmental standards that are applicable. No alternatives were identified that met these



criteria for being reasonable alternatives to the Proposed Action; consequently, none were evaluated further in the EA. The No-Action Alternative is considered the only reasonable alternative to the Proposed Action.

Under the No-Action Alternative, there would be no implementation of the WINDO projects included in the Proposed Action. Operations on Shaw AFB and Poinsett ECR would continue using current facilities. There would be no new construction, upgrades, or improvements of the facilities included in the Proposed Action, and the facility needs that drove the proposals for each of the projects would remain unmet. This alternative would limit the ability of Shaw AFB to perform certain aspects of its missions and to satisfy certain Department of Defense, United States Air Force, and other requirements.

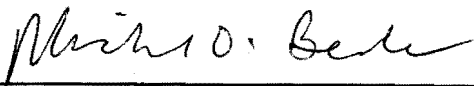
**SUMMARY OF FINDINGS:** The EA found that implementation of the Proposed Action would not result in significant adverse impacts on any environmental resource, including land use, infrastructure, socioeconomics and environmental justice, cultural resources, biological resources, water resources, air quality, hazardous materials and waste management, safety, and noise. The Proposed Action would result in beneficial impacts on land use and transportation, infrastructure, socioeconomics, and safety. Both direct and indirect effects were considered, and cumulative impacts from other ongoing and reasonably foreseeable future actions at the base were considered in conjunction with the Proposed Action. The Proposed Action would result in adverse impacts only on biological resources and water resources. These adverse impacts would be relatively minor and, based on their context and intensity, none would be significant.

The No-Action Alternative would have adverse impacts on transportation components of land use, biological and water resources, hazardous materials and waste management, and safety. However, it was determined that these adverse impacts would be relatively minor and, based on their context and intensity, none would be significant.

The conclusion of this EA that implementation of the Proposed Action would not result in any significant adverse environmental impacts indicates that preparation of a Finding of No Significant Impact is appropriate for this action and that preparation of an Environmental Impact Statement (EIS) is not required.

**CONCLUSION:** Based upon my review of the facts and analyses contained in the EA, which is incorporated by reference herein, I conclude that the Proposed Action will not have a significant effect on the human environment. An EIS is not required for this action. This document and the supporting EA fulfill the requirements of NEPA, the CEQ regulations, and the Air Force EIAP.

Approved:

  
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MICHAEL O. BEALE, Colonel, USAF  
Vice Commander

27 JUL 05  
Date

**FINAL**

**ENVIRONMENTAL ASSESSMENT**

**FOR**

**WING INFRASTRUCTURE DEVELOPMENT OUTLOOK (WINDO) PLAN**

**SHAW AIR FORCE BASE, SOUTH CAROLINA**

**20th Fighter Wing  
Air Combat Command**

**October 2004**

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## **LIST OF ACRONYMS**

ACC	Air Combat Command
ACM	asbestos-containing material
ACOMS	Air Communications Squadron
ADP	Area Development Plan
AF	Air Force
AFB	Air Force Base
AFI	Air Force Instruction
AFM	Air Force Manual
AFOSH	Air Force Occupational Safety and Health
AFOSI	Air Force Office of Special Investigation
AICUZ	Air Installation Compatible Use Zone
AMP	Asbestos Management Plan
APZ	Accident Potential Zone
AST	above-ground storage tank
AT/FP	antiterrorism/force protection
B	Building
BCP	Base Comprehensive Plan
BREC	Black River Electric Cooperative
BX	Base Exchange
CAA	Clean Air Act
CATM	Combat Arms Training and Maintenance
CEQ	Council on Environmental Quality
CERCLA	Comprehensive Environmental Response, Compensation, and Liability Act
CFR	Code of Federal Regulations
CO	carbon monoxide
CP&L	Carolina Power and Light Company
CRMP	Cultural Resources Management Plan
CWA	Clean Water Act
dB	decibel
DNL	Day-Night Average Sound Level
DoD	Department of Defense
DOL	Department of Labor
DOT	Department of Transportation
DRMO	Defense Reutilization and Marketing Office
EA	Environmental Assessment
ECR	Electronic Combat Range
EIAP	Environmental Impact Analysis Process
EIS	Environmental Impact Statement
EO	Executive Order
EPA	Environmental Protection Agency
ERP	Environmental Restoration Program
ETSC	endangered, threatened, and special concern
FONSI	Finding of No Significant Impact



### **LIST OF ACRONYMS (continued)**

FS	Fighter Squadron
FW	Fighter Wing
FY	fiscal year
gpm	gallon per minute
HAP	Hazardous Air Pollutant
HC	hydrocarbon
HQW	High Quality Waters
HUD	Housing and Urban Development
HWMP	Hazardous Waste Management Plan
IB	inhabited building
JCLUS	Joint Compatible Land Use Study
LBP	lead-based paint
Ldn	Day-Night Average Sound Level
mgd	million gallons per day
MILCON	Military Construction
MSL	mean sea level
NAAQS	National Ambient Air Quality Standard
NEPA	National Environmental Policy Act
NESHAP	National Emission Standards for Hazardous Air Pollutants
NO <sub>x</sub>	nitrogen oxides
NPDES	National Pollutant Discharge Elimination System
NPS	non-point source
NRHP	National Register of Historic Places
O <sub>3</sub>	ozone
ORW	Outstanding Resources Waters
OSS	Operations Support Squadron
PASA	Permanent Air Sovereignty Alert
Pb	lead
POL	petroleum, oil, and lubricants
PM <sub>10</sub>	particulate matter less than 10 microns in diameter
PMEL	Precision Measurement Equipment Laboratory
PSD	Prevention of Significant Deterioration
Q-D	quantity-distance
RCRA	Resource Conservation and Recovery Act
ROI	region of influence
SCDHEC	South Carolina Department of Health and Environmental Control
SDZ	surface danger zone
SF	square feet
SHPO	State Historic Preservation Office
SIC	Standard Industrial Classification
SIP	State Implementation Plan
SM	square meters
SO <sub>2</sub>	sulfur dioxide

**LIST OF ACRONYMS (continued)**

SR	State Route
SWPPP	Stormwater Pollution Prevention Plan
TAP	Toxic Air Pollutant
TRS	Tactical Reconnaissance Squadron
TRW	Tactical Reconnaissance Wing
TSCA	Toxic Substances Control Act
TSD	treatment, storage, and disposal
TTU	Thermal Treatment Unit
U.S.	United States
USACE	United States Army Corps of Engineers
USAF	United States Air Force
USC	United States Code
USCENTAF	United States Central Command Air Forces
USFWS	United States Fish and Wildlife Service
UST	underground storage tank
VDZ	vertical danger zone
VOC	volatile organic compound
WINDO	Wing Infrastructure Development Outlook
WWTP	wastewater treatment plant

## **EXECUTIVE SUMMARY**

This Environmental Assessment (EA) evaluates the impacts of executing 17 of the proposed projects in the Wing Infrastructure Development Outlook (WINDO) Plan for Shaw Air Force Base (AFB), South Carolina. This EA has been prepared in accordance with the National Environmental Policy Act of 1969 (NEPA), the Council on Environmental Quality regulations implementing NEPA, and Air Force Instruction 32-7061, *The Environmental Impact Analysis Process*, as codified in Title 32, Code of Federal Regulations, Part 989.

### **PURPOSE AND NEED FOR ACTION**

The purpose of the Proposed Action is to provide infrastructure improvements needed to support the base mission, as outlined in the WINDO Plan for Shaw AFB. The WINDO Plan projects proposed for execution as part of the Proposed Action reflect the Wing Commander's vision of infrastructure improvements needed at Shaw AFB to ensure that the military mission of the 20th Fighter Wing is enhanced and not compromised. The need for the Proposed Action varies for each of the individual WINDO projects included. Twelve of the 17 projects would serve to enhance or repair existing facilities on base, and/or replace a temporary or inadequate structure with a permanent structure, or, in the case of the Memorial Lake Amphitheater, provide a new facility. The remaining five proposed projects are related to improvement to the Main Gate on Shaw Drive and lighting enhancements at all entrances to the base for the purposes of improving safety, security, and appearance.

### **PROPOSED ACTION AND ALTERNATIVES**

The EA evaluates the impacts associated with the Proposed Action and the No-Action Alternative. The specific projects included in the Proposed Action are projects from the 2005 WINDO document that: (1) are scheduled to begin by fiscal year (FY) 2006, (2) are not covered by a categorical exclusion or an ongoing EA, and (3) are estimated to have a total cost of \$100,000 or greater. Descriptions of each WINDO project included in the Proposed Action are provided in Table 2-1. The projects are grouped in the table

based on the area of the base in which they are located (West Base, East Base, entrance gates, Poinsett Electronic Combat Range [ECR]). Under the No-Action Alternative, there would be no new construction, upgrades, or improvements of the facilities included in the Proposed Action, and the facility needs that drove the proposals for each of the projects would remain unmet.

## **SUMMARY OF ENVIRONMENTAL CONSEQUENCES**

This EA evaluates the potential environmental consequences associated with construction of the WINDO projects included in the Proposed Action and associated with the No-Action Alternative. Ten resource categories were addressed to identify potential impacts: land use, infrastructure, socioeconomics and environmental justice, cultural resources, biological resources, water, air quality, hazardous materials and waste management, safety, and noise. As indicated in Chapter 4, and summarized in Table 2-3, no potentially significant adverse impacts were identified for either the Proposed Action or the No-Action Alternative.

**Land Use Resources.** Implementation of the Proposed Action would be consistent with base plans. The projects associated with entry control points for the base would serve to improve the flow of traffic entering the base and to increase safety, and would have a beneficial impact on transportation facilities on and off-base. The proposed projects would improve the appearance of the existing structures on-base and enhance the visual resources already existing on the base. No significant adverse impacts are anticipated on land use, transportation, or visual resources.

**Infrastructure.** There would be no significant adverse impacts from the Proposed Action on the infrastructure systems and facilities on Shaw AFB. The major utility systems on base (electrical, potable water, wastewater, and natural gas) have extensive available capacity remaining.

**Socioeconomics and Environmental Justice.** Population and economic effects of the Proposed Action would not result in adverse impacts on the region. Economic activity associated with construction of the proposed WINDO projects would provide short-term

benefits to the local economy. Operation of facilities affected by the proposed WINDO projects, once construction is complete, would provide a minor economic benefit to the Shaw AFB region.

**Cultural Resources.** The Proposed Action would not impact known cultural resources on Shaw AFB or Poinsett ECR, and there is only a minimal potential for the Proposed Action to impact undiscovered cultural resources at Shaw AFB as a result of excavation during construction activities. Thus, the Proposed Action would have no significant adverse impact on cultural resources.

**Biological Resources.** The consequences of the Proposed Action for the biological resources of Shaw AFB and Poinsett ECR would not differ appreciably from existing conditions. Certain species may be impacted at a low level under the Proposed Action by effects from construction activities, such as land clearing for new construction, sedimentation, tree removal, or noise. However, evaluation of the context and intensity of these ecological effects indicates that they would not result in significant impacts on biological resources.

**Water Resources.** Given that most of the proposed construction activities would occur in developed areas of the base, actual impacts on surface water resources from the Proposed Action would be minimal. Groundwater recharge in the vicinity potentially could be adversely affected by increases in impervious surface area. However, impervious surface area is expected to increase only minimally, and stormwater management systems implemented in conjunction with the proposed projects would reduce any impacts on groundwater recharge.

**Air Quality.** The 17 proposed WINDO projects included in the Proposed Action would not substantially change existing operational emissions and, therefore, would not increase ambient concentrations of air pollutants in Sumter County. All of the WINDO projects either replace or enhance existing facilities. A simple dispersion model was used to provide an approximate measure of the impact of construction-related air emissions to the air shed over the base. It can be concluded that air quality effects of construction

activities is negligible both in the immediate vicinity of the base and in the surrounding areas.

**Hazardous Materials and Waste Management.** Under the Proposed Action, there would be minor beneficial and adverse impacts associated with hazardous material and waste management on Shaw AFB. However, none of these impacts would be significant. The generation of hazardous waste would be short term, occurring only during the renovation or demolition of structures and, given the limited number and size of the buildings that may be involved, the magnitude of the waste that would be produced is expected to be minor. Given that only one of the projects included in the Proposed Action is located near an Environmental Restoration Program (ERP) site, that the ERP sites potentially near this project are all closed or pending closure, and that the locations of these sites would be considered in final siting decisions regarding this project, it is concluded that there would be no significant adverse effects associated with hazardous waste sites as a result of the Proposed Action.

**Safety.** Under the Proposed Action, general operational safety would not be appreciably impacted by construction-related hazards. Munitions safety would be improved by a project to repair the bullet trap at the small arms range. Aviation safety would not be adversely affected by the proposed projects. Force protection would be significantly improved as a result of projects involving gates, lighting, and parking, resulting in beneficial impacts on safety. Accordingly, the overall impact of the Proposed Action of safety at Shaw AFB would be beneficial.

**Noise.** None of the WINDO projects are anticipated to create operational noise impacts within Shaw AFB that are significantly different from noise levels currently experienced. Temporary construction noise impacts are anticipated as a result of the proposed WINDO projects. These impacts would be of a relatively short duration and most would be confined within the boundaries of Shaw AFB. Temporary construction noise impacts were quantified using simplified modeling. Although some temporary adverse noise impacts are anticipated to occur, they are not considered significant. Therefore, the

operational and temporary construction noise effects would have no significant adverse impact.

**No-Action Alternative.** Under this alternative, there would be no implementation of the WINDO projects included in the Proposed Action. Operations on Shaw AFB and Poinsett ECR would continue using current facilities. There would be no new construction, upgrades, or improvements of the facilities included in the Proposed Action, and the facility needs that drove the proposals for each of the projects would remain unmet. This alternative would limit the ability of Shaw AFB to perform certain aspects of its mission and to satisfy certain Department of Defense, United States Air Force, and other requirements.

## **1.0 PURPOSE AND NEED FOR ACTION**

### **1.1 INTRODUCTION**

This Environmental Assessment (EA) evaluates the impacts of executing 17 proposed projects in the Wing Infrastructure Development Outlook (WINDO) Plan for Shaw Air Force Base (AFB), South Carolina. The purpose and need for this action are described below. This EA has been prepared in accordance with provisions of 32 Code of Federal Regulations (CFR) 989 and Air Force Instruction (AFI) 32-7061, the Environmental Impact Analysis Process (EIAP).

The WINDO was developed to improve the facility planning process. The purpose of the WINDO is to outline the infrastructure improvements needed to support the base mission. The WINDO links the Shaw AFB General Plan to funding sources such as military construction, operations and maintenance, restoration and modernization, non-appropriated funding, anti-terrorism and force protection, and others. The WINDO ensures that the Wing Commander, Base, and Air Combat Command (ACC) have a common set of infrastructure goals and priorities that will enable continued operations at the base.

The analyses in this EA are based on the best available information for each of the WINDO projects. In some cases, site plans were available. In other cases, only a Work Order description was available. In cases where limited information was available, general assumptions were made to estimate project impacts. All impacts were estimated conservatively to ensure that all potential impacts were considered even if modifications to individual projects are required as each project develops. This EA is written in a manner intended to provide Shaw AFB with flexibility in the project development process while accurately portraying potential impacts to both the natural and human environments.

### **1.2 BACKGROUND**

Shaw AFB is located in the east-central part of South Carolina, approximately 35 miles east of Columbia, the state capital. The base also is ten miles west of the center of the city of Sumter and within its city limits (Figure 1-1). The city of Sumter is within Sumter County, which is bounded by the Wateree River to the west and the Lynches River to the east. Outside the main population center in and around the city of Sumter, the county is covered mainly by a mixture of farmland, forests, and wetlands.

Shaw AFB also is responsible for the 12,400-acre Poinsett Electronic Combat Range (ECR), located approximately 15 miles south of the base between the towns of Wedgefield and Pinewood, and the Wateree Recreation Area, located approximately 35 miles northwest of the base. The Poinsett ECR is an auxiliary facility that provides a combat training environment for aircrews. Only one of the WINDO projects being evaluated is located on the Poinsett ECR. Therefore, the assessment in this EA of the existing environment and potential impacts on Poinsett ECR will be focused on the



vicinity of that project location rather than encompassing the entire range. The Wateree Recreation Area is an auxiliary facility that provides boating, camping, and picnic facilities on Lake Wateree. None of the WINDO projects being evaluated is located in the Wateree Recreation Area, and it is not considered further in this EA.

### 1.2.1 History

Shaw Field was officially established on August 30, 1941 and was named after 1st Lt. Ervin D. Shaw, a Sumter County resident who was killed in action during World War I. Shaw Field was one of the largest flying fields in the country, and its initial mission was to train pilots to fly. The first cadets arrived in December 1941 (SAFB 1999).

Following World War II, the 20th Fighter-Bomber Group arrived at Shaw Field with P-51 Mustang fighters. In 1948, Shaw Field was designated as an AFB and transferred to the Continental Air Command. Its aircraft were converted from the P-51 to Shaw's first jet aircraft, the P-84 Thunderjet. Shaw was transferred to the Tactical Air Command in December 1950. The 363rd Tactical Reconnaissance Wing (TRW) transferred from Langley AFB, Virginia, on April 1, 1951 and doubled the activity at Shaw AFB. By November 1951, however, the 20th Fighter-Bomber Wing transferred to Langley AFB, and the 363rd TRW became the parent wing at Shaw AFB. Headquarters 9th AF was assigned to Shaw from Pope AFB, North Carolina, on September 1, 1954. The first RF-4C Phantom aircraft arrived at SAFB in 1965, and shortly after, the 16th Tactical Reconnaissance Squadron (TRS) became the first combat ready RF-4C Squadron in the United States Air Force (USAF) (SAFB 1999 and 2004a).

The 363rd TRW was redesignated as the 363rd Tactical Fighter Wing on October 1, 1981. The Wing received its first F-16 Fighting Falcon on March 22, 1982. As part of the USAF reorganization in 1992, Shaw AFB became an ACC installation. On January 1, 1994, the 363rd and its four Fighter Squadrons (FS) (17th, 19th, 21st, and 309th) were redesignated as the 20th Fighter Wing (FW) with the 55th, 77th, 78th, and 79th FS. In 1996, the A/OA-10 Thunderbolt II aircraft and the personnel of the 55th FS were relocated to Pope AFB, North Carolina. However, the squadron itself did not move; instead, a fourth F-16 squadron was relocated to Shaw AFB and was designated the 55th FS (SAFB 1999).

### 1.2.2 Military Mission

The 20th FW is the base host wing and operates the 55th, 77th, and 79th FS. The mission of the 20th FW is to provide, project, and sustain combat-ready air forces and "...execute directed missions designed to identify and destroy enemy forces' supplies, equipment, communications systems, and installations...within the design limits of the weapon system capabilities." (SAFB 1999). As host wing at Shaw AFB, the 20th FW retains the responsibility for providing facilities, personnel, and materiel for the operation of Shaw AFB. The mission of Shaw AFB is to sustain the resources and relationships deemed appropriate to pursue national interests and provide for the command, control, and

communications necessary to execute the missions of the USAF, ACC, 9th AF, and 20th FW.

Headquarters 9th AF is the major tenant at Shaw AFB. It exercises control over ten active duty ACC Wings in the continental United States (CONUS) as well as numerous Air Force Reserve and Air National Guard units. The 9th AF also maintains a continuous tactical control support system capable of providing direction to air elements and to direct-fire-support ground forces, and it provides a deployable combat intelligence capability in direct support of the Air Force Tactical Air Control System. The 9th AF also is the USAF component of Central Command, which is referred to as the United States Central Command Air Forces (USCENTAF) and is a major tenant at Shaw AFB. USCENTAF is responsible for fighter, bomber, tanker, airlift, and air control operations and training in the eastern U.S., and it plans for and executes the integration of joint U.S. and multinational forces into coherent air operations in support of major theater war.

Other associate units/functions that Shaw AFB supports are (SAFB 1999):

- 682nd Air Support Operations Center Squadron;
- Detachment 718, Air Force Office of Special Investigation (AFOSI);
- Detachment 212, AFOSI;
- 337th Recruiting Squadron;
- Detachment 307, Field Training;
- Detachment QD 20, Area Defense Council;
- Defense Commissary Agency;
- Detachment 261, Air Force Audit Agency;
- Army Air Force Exchange Service;
- Defense Reutilization and Marketing Office (DRMO);
- Poinsett ECR.

### 1.3 PURPOSE AND NEED

The WINDO Plan projects proposed for execution as part of the Proposed Action reflect the Wing Commander's vision of infrastructure improvements needed at Shaw AFB to ensure that the military mission of the 20th FW is enhanced and not compromised. The specific projects included in this EA were projects from the 2005 WINDO document that: (1) were scheduled to begin by fiscal year (FY) 2006, (2) were not covered by a categorical exclusion or an ongoing EA, and (3) were estimated to have a total cost of \$100,000 or greater. The purposes and needs for the individual projects in the WINDO Plan for Shaw AFB that were selected for assessment are summarized in Table 1-1. The projects are grouped in the table based on the area of the base in which they are located (West Base, East Base, Poinsett ECR), and the projects related to entrance gates, all of which are on the west side of the base, are grouped separately. The information for each project is presented in the following order: project map ID, project number, project title, project description.

**Table 1-1. Identified Purpose and Need for WINDO Projects Included in this EA**

<b><u>West Base</u></b>		
A8	VLSB960053	Construct Memorial Lake Amphitheater  In accordance with AF policy on quality of life and preservation of open space, Shaw AFB should provide an adequate facility for concert and social activities. The amphitheater will be the only such outdoor space at Shaw AFB.
A25	VLSB010057	Construct addition to the Precision Measurement Equipment Laboratory (PMEL)  The current PMEL facility lacks adequate floor space for the inventory supported. It is 740 square feet (SF) short in the calibration/repair area and 592 SF short in the scheduling area. As a work-around, some storage and administrative functions are being carried out in the laboratory, in violation of Technical Order 00-20-14 Paragraph 3.9.2X.
A28	VLSB030214A	Construct Addition to Intelligence Flight Building 710 (B710)  Additional work space is needed in B710, which houses the Intelligence Flight that is under the 20th Operations Support Squadron (OSS). The current facility is inadequate for accommodating the increase in personnel.
A49	VLSB970014	Construct Wastewater Treatment Plant (WWTP) Operations Facility  Construction of a new WWTP Operations Facility is needed to provide administrative office space and maintenance work bays to repair pumps and other equipment used in the operation of the WWTP. The existing operations are co-located with the Entomology Shop, violating USAF regulations that prohibit co-use of a facility that utilizes pesticides and does not have a secure vapor-impervious partition.
A66	VLSB040017	Construct Educational Addition to Main Chapel  An addition to the main chapel (Palmetto Chapel) is needed to provide space for additional educational training.
B5	VLSB043001R1	Construct Addition to Fitness Center  An addition to and alteration of the existing Physical Fitness Center is needed to promote higher levels of personal fitness and wellness of AF members. Additional space is required to provide necessary areas for cardiovascular, aerobic, weight, and water training. There is currently no enclosed pool on the base. During the winter months, swimming, water sports, and aerobics are not available. The crowded conditions at this facility create the potential for accidents, and potentially hamper AF members from reaching the required level of physical fitness.

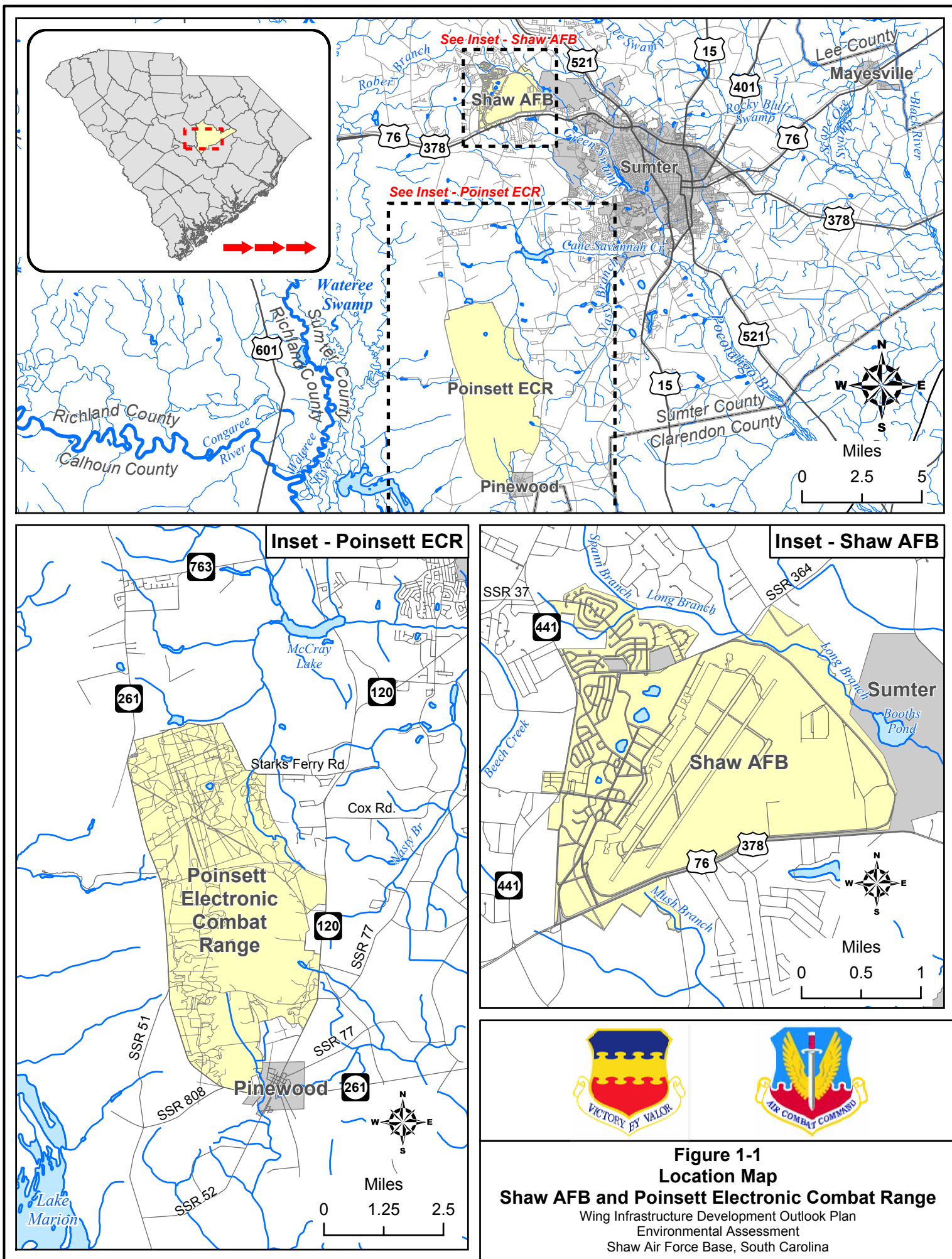
H11	VLSB020047	Construct Dormitory Parking
<p>New dormitory parking is needed to comply with Antiterrorism/Force Protection (AT/FP) measures. The parking will be located 80 feet from all dorm facilities with no parking between the structures, and it will replace the current degraded and limited dorm parking.</p>		
<b><u>East Base</u></b>		
A33	VLSB010030	Repair Bullet Trap (B1833) at the Combat Arms Training and Maintenance Facility (CATM) Facility
<p>The bullet trap system is needed to increase the capabilities and safety of the small arms range. The range currently uses an earthen backstop that does not prevent bullets (9 mm and 5.56 mm ammunition) from exiting the range. Retaining the earthen backstop potentially limits the training that can be conducted at the range and negatively impacts the wing's wartime and peacetime mission capabilities. Due to extensive erosion, soil is needed every 2-3 years to comply with the requirement for 2 meters of rock-free soil. The current condition of the backstop allows rounds to ricochet out of the range, increasing the surface danger zone (SDZ), the vertical danger zone (VDZ), and the potential for mishaps. The bullet trap would decrease the SDZ and VDZ requirements by reducing the potential for rounds to exit the range. In addition, there are environmental concerns associated with lead contamination, resulting in the need to mine/de-lead the earthen backstop every two years (Behr 2004b).</p>		
A51	VLSB010031	Construct New CATM Facility (B1846)
<p>A new combat arms facility is needed to provide administrative offices, areas for weapon maintenance and storage, and training classrooms. The current facility has been condemned due to the presence of asbestos materials. Continuous exposure to asbestos could cause long-term health problems for combat arms personnel. If the facility was closed and not replaced, the training capacity for the wing would be severely reduced.</p>		
B4	VLSB983002R3	Construct USCENTAF Communications Squadron Facility
<p>A new USCENTAF Communications Squadron Facility is needed for the 609th Air Communications Squadron (ACOMS). This construction would include the demolition/asbestos removal of 11 buildings and consolidation of squadron functions. The 609th ACOMS currently operates from 17 facilities that were built from the 1940s to the mid-1980s. Many of the buildings are metal frame structures with increasing heating and cooling costs. The current buildings lack adequate space for testing, calibration, and repair of computer and communication equipment. Training rooms are inadequately sized and hinder the upgrading of individual career field specifications needed to work on the advanced equipment deployed by ACOMS. The existing facilities do not allow the Air Operations Center to function as it would in contingency situations. Some of the buildings are 4 miles apart, and this fragmentation of unit integrity hampers logistics and manpower planning and control.</p>		

<b><u>Entrance Gates</u></b>		
H3	VLSB020042	Construct Main Gate
<p>A new Main Gate on Shaw Drive is needed at a location on base that will allow construction of adequate vehicle inspection areas, lighting, barriers, etc. The existing Main Gate entrance is located adjacent to an off-base wooded area that does not provide adequate space for search and inspection of suspect vehicles. Additionally, the current location of the Main Gate has caused traffic to back up onto U.S. Highway 76/378, causing a potential for vehicle accidents.</p>		
H4	VLSB040055	Install Fence at New Main Gate
<p>A fence at the location of the new Main Gate is needed to replace a chain link fence. The new fence will be built with wrought iron and brick pillars to match the fence at the current Main Gate.</p>		
H5	VLSB020043	Construct New Visitor Center
<p>A new Visitor Center is needed to complement the new Main Gate location. The existing Visitor Center is not conducive to controlling access by base visitors.</p>		
H6	VLSB020048	Install Lighting at Entry Gates
<p>Lighting is needed at all entrance gates to aid in spotting vehicles and personnel approaching and to increase overall safety. Additional lighting is also needed along 6,000 linear feet of Highway 441 to aid in base patrols. The current lighting is poor, which makes the Main Gate entrance susceptible to attack. Ample lighting would help deter possible attacks.</p>		
H7	VLSB010080	Construct Permanent Gate at Palmetto Heights
<p>A permanent gatehouse is needed at the entrance to the Palmetto Heights housing area. A temporary gatehouse was placed at this entrance following 9/11/2001 to check vehicles entering the housing area, and it is still being used. The temporary gatehouse detracts from the appearance of the base and is not an adequate facility for Security Forces personnel.</p>		
H9	VLSB020045	Alter Intersection of Aiken Street and Shaw Drive
<p>The intersection of Aiken Street and Shaw Drive needs to change to accommodate the location of the new Main Gate. The current intersection interferes with the required traffic lanes and flow at the Main Gate. New inspection procedures require a revision to the location of this intersection.</p>		

<b><u>Poinsett ECR</u></b>
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A52    VLSB960022                      Construct Administrative Facility, Poinsett ECR
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<p>A new administrative building at Poinsett ECR is needed to replace the existing trailer. The trailer has been used several years, and is not in conformance with current building code practices. Due to changes in mission requirements for the range, more personnel and equipment are needed to properly maintain valuable government assets.</p>
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## **2.0 DESCRIPTION OF PROPOSED ACTION AND ALTERNATIVES**

This chapter describes the Proposed Action that is the subject of this EA, alternatives to the Proposed Action, and the environmental impact analysis process. It concludes with a section that compares the alternatives and summarizes the conclusions of the EA.

### **2.1 PROPOSED ACTION**

The Proposed Action for which this EA is being prepared is the execution of 17 projects included in the WINDO Plan for Shaw AFB. The implementation of these projects would sustain the missions of Shaw AFB. The purposes and needs for these proposed WINDO projects were identified in Section 1.3. The locations of the projects on Shaw AFB are shown in Figures 2-1a through 2-1d, and the location of the project on Poinsett ECR is shown in Figure 2-2. Each project location is labeled in the figures using its project map ID.

Descriptions of each WINDO project included in the Proposed Action are provided in Table 2-1. The projects are grouped in the table based on the area of the base in which they are located (West Base, East Base, Poinsett ECR), and the projects related to entrance gates, all of which are on the west side of the base, are grouped separately. The descriptions include the available information on each project, such as building sizes, locations, and costs. The information for each project is presented in the following order: project map ID, project number, project title, project description. Where available, site plans of individual projects are provided as supplemental information in Appendix A.

Four of the WINDO projects included in Table 2-1 were constructed prior to the completion of this EA: installation of a fence at the Main Gate (H4), construction of a permanent gate at Palmetto Heights (H7), construction of an addition to the Intelligence Flight Building (A28), and repair of the bullet trap at the CATM Facility (A33). Inclusion of these projects within this EA facilitates consideration of their impacts in conjunction with the other WINDO projects.

Although the impacts of all of the above projects are evaluated as part of the Proposed Action, it is likely that only a portion of the projects will be under construction at any given time. Therefore, it was assumed for the purposes of evaluating construction-related impacts in this EA that approximately one-third of the projects may be under construction at the same time. It was also assumed that all of the proposed projects would be constructed within a five-year time frame. This assumption was based on the following: inclusion in the Proposed Action of only WINDO projects that are programmed for funding in FY 2004 through FY 2006, the expectation that a given project could be completed within three years (i.e., a project begun in 2006 would be completed in 2009), and the resulting time span from the start of some projects in 2004 to the likely completion of all projects by 2009 (i.e., five years). However, it is possible that some projects may not be implemented during this interval due to changes in priorities, funding, or other factors.



**Table 2-1. Descriptions of WINDO Projects Included in the Proposed Action**

<b><u>West Base</u></b>		
A8	VLSB960053	Construct Memorial Lake Amphitheater  An amphitheater would be constructed at the edge of Memorial Lake. The amphitheater would have the capacity to seat 400 people and would include eight rows of semicircular seating focusing on an 840 SF platform stage, sidewalks, sound system, and lights for night programs. It would be located near the intersection of Rhodes and Parkinson Streets.
A25	VLSB010057	Construct Addition to the PMEL  A 4,000 SF addition to the PMEL (B826) would be constructed. The addition would include mechanical space, bathrooms for men and women, scheduling/receiving area, technical library, and training area. Fire suppression also would be installed in the addition. The PMEL is located near the intersection of Polifka Drive and Lance Avenue.
A28	VLSB030214A	Construct Addition to Intelligence Flight Building (B710)  A 2,100 SF addition to B710 was constructed to provide additional work space for the Intelligence Flight, which is part of the 20th OSS. Fire suppression and safety requirements were installed in the new structure. B710 is located just west of the flight line on Killian Avenue.
A49	VLSB970014	Construct WWTP Operations Facility  A stand-alone WWTP Operations Facility would be constructed. The facility would include administrative offices and maintenance work bays for repair of pumps and other equipment used in the operation of the WWTP. The WWTP is located in the southwestern portion of the base near the intersection of Aiken Street and Chapin Street.
A66	VLSB040017	Construct Educational Addition to Main Chapel  An addition to the main chapel (Palmetto Chapel) would be constructed to provide additional space for educational training. The chapel is located near the intersection of Shaw Drive, Mitchell Street, and Nelson Avenue.

B5	VLSB043001R1	Construct Addition to Fitness Center	<p>A 2,791 SF addition to the existing Physical Fitness Center would be constructed to promote higher levels of personal fitness and wellness of AF members. The construction would include metal frame building, concrete floor and foundation, brick veneer, standing seam metal roof, parking, sidewalk, and water, sewer, and electrical service. Space would be provided for weight, cardiovascular, and aerobic training; an indoor running track above the existing basketball courts; and an indoor pool. The addition would be added at the location of the existing parking lot. The facility would meet Seismic Zone 2 Specifications, and Force Protection would comply with minimum Department of Defense (DoD) interim standards. The Fitness Center is located near the intersection of Shaw Drive, Mitchell Street, and Nelson Avenue, across from the main chapel.</p>
H11	VLSB020047	Construct Dormitory Parking	<p>A new dorm parking area would be constructed to replace the current parking lot. It would be located 80 feet from all dorm facilities, with no parking between the structures. The new parking area would be located near Polifka Drive, Fordyce Street, and Johnson Street.</p>
<b><u>East Base</u></b>			
A33	VLSB010030	Repair Bullet Trap (B1833) at the CATM Facility	<p>A Savage Model 855 bullet trap system 108 feet in length was installed behind the target line of the small arms range (B1833). The project also included installation of a 3-phase electric system and notching of an existing concrete slab. The CATM Facility is located on Patrol Road.</p>
A51	VLSB010031	Construct New CATM Facility	<p>A new 3,150 SF combat arms facility would be constructed in accordance with standards prescribed in ETL 02-11. The building would be built in the area of the current parking lot and would include administrative offices, a weapon maintenance and storage area, an alarmed weapons and munitions storage room, and training classrooms. The CATM Facility is located on Patrol Road.</p>

B4	VLSB983002R3	Construct USCENTAF Communications Squadron Facility	<p>A new USCENTAF Communications Squadron Facility would be constructed for the 609th ACOMS. The project would include site improvements, the demolition/asbestos removal of 11 buildings with total floor space of 3,723 square meters (SM) (40,074 SF), and installation of a concrete foundation and floor slab, masonry walls, standing seam metal roof, utilities, fire detection/protection, fencing, landscaping, pavements, and communication support. This new facility would be 4,590 SM (49,406 SF) in size, constructed to Seismic Zone 2 specifications, and able to withstand hurricane force winds of 100 miles per hour per the 2000 International Building Code, paragraph 1609.6.2. Force Protection will comply with the DoD minimum antiterrorism standards. The new facility would be located on Dryden Way near the eastern perimeter of the base.</p>
<b><u>Entrance Gates</u></b>			
H3	VLSB020042	Construct Main Gate	<p>A new Main Gate would be built at a location approximately 800 feet north of the existing gate on Shaw Drive near the southwest corner of the base. The project would allow construction of adequate vehicle inspection areas, lighting, barriers, etc. Companion projects would include alteration of Aiken Street and Shaw Drive, fencing, landscaping, and other projects.</p>
H4	VLSB040055	Install Fence at Main Gate	<p>A new fence of wrought iron and brick pillars was built at the new Main Gate to replace the existing chain link fence. Approximately 490 linear feet of wrought iron fencing were required for this project.</p>
H5	VLSB020043	Construct New Visitor Center	<p>A new Visitor Center would be constructed to complement the new Main Gate location.</p>
H6	VLSB020048	Install Lighting at Entry Gates	<p>Lighting would be installed at all entrance gates to aid in spotting approaching vehicles and personnel and increase overall safety. Additional lighting would also be added along 6,000 linear feet of Highway 441 to aid in base patrols.</p>

H7	VLSB010080	Construct Permanent Gate at Palmetto Heights	<p>A permanent gatehouse was constructed at the entrance to the Palmetto Heights housing area to replace the existing temporary gatehouse, which was placed at the housing entrance following 9/11/2001 to check vehicles entering the housing area. The gatehouse is located in the northwest portion of the base on Sycamore Street where Palm Circle and Almond Circle intersect.</p>
H9	VLSB020045	Alter Intersection of Aiken Street and Shaw Drive	<p>The intersection of Aiken Street and Shaw Drive would be altered to accommodate the location of the new Main Gate. Aiken Street would be rerouted to the north of the Airplane Park and would intersect with Shaw Drive at a 90-degree angle. The portion of Aiken Street currently located in front of the aircraft display would be closed from Shaw Drive to the new, relocated Aiken Street.</p>
<b><u>Poinsett ECR</u></b>			
A52	VLSB960022	Construct Administrative Facility, Poinsett ECR	<p>A new administrative building at Poinsett ECR would be constructed to replace the existing trailer. The trailer was used by 9th AF for several years prior to being moved to the range and has been on the range for seven years. This project is part of the range upgrade/expansion program. The new building would be located in the administrative area on the northern portion of Poinsett ECR.</p>

## 2.2 METHODOLOGY FOR ALTERNATIVE IDENTIFICATION

The Air Force EIAP, in compliance with the Council on Environmental Quality (CEQ) regulations, requires that, in addition to the Proposed Action, the No-Action Alternative and all other reasonable alternatives be evaluated in the EA. Reasonable alternatives are those that “meet the underlying purpose and need for the Proposed Action and that would cause a reasonable person to inquire further before choosing a particular course of action” (32 CFR 989). Alternatives may be eliminated from detailed analysis based on operational, technical, or environmental standards that are applicable to the project.

For example, the ability of an alternative to satisfy the operational and technical objectives of the project is a principal determinant of whether the alternative is reasonable. Any alternative, other than the No-Action Alternative, that does not satisfy the purpose and need for the Proposed Action is rejected as a reasonable alternative. Also critical is the ability of an alternative to meet established environmental protection standards or regulatory or public expectations of environmental protection. Any alternative likely to cause a significant, non-mitigable environmental impact that would result in regulatory or public opposition is not considered a reasonable alternative and is not evaluated further.

## 2.3 ALTERNATIVES TO THE PROPOSED ACTION

The National Environmental Policy Act (NEPA) and USAF guidelines require that, in addition to the Proposed Action and No-Action Alternative, other alternatives be considered for evaluation. In addition to the No-Action Alternative described in Section 2.4, alternatives based on the potential for the proposed facilities to be constructed at other locations were considered. Some of the WINDO projects potentially could be constructed at locations other than those specifically identified in Table 2-1 and shown in Figures 2-1a through 2-1d and 2-2.

However, in order to meet the identified purposes and needs of each project, the facilities would need to be located on the base, in the same area of the base, and in most cases, in the same location identified in the Proposed Action. This is the case because the functions of the facilities are tied to their locations, their proximity to other facilities, and mission requirements. Even if it were practicable to site one or more of the proposed projects at alternative locations, their environmental impacts would be similar to their impacts under the Proposed Action. The projects address specific needs that base units have identified as being required to continue their efficient support of their respective missions. These considerations provided the siting criteria for the projects. The conclusion for each project was that if the projects were not sited as proposed, project objectives would not be met. Consequently, no alternatives were identified that met the criteria for being reasonable alternatives to the Proposed Action.

## 2.4 NO-ACTION ALTERNATIVE

Under the No-Action Alternative, there would be no implementation of the WINDO projects included in the Proposed Action. Operations on Shaw AFB and Poinsett ECR would continue using current facilities. There would be no new construction, upgrades, or improvements of the facilities included in the Proposed Action, and the facility needs that drove the proposals for each of the projects would remain unmet. This alternative would limit the ability of Shaw AFB to perform certain aspects of its missions and to satisfy certain DoD, USAF, and other requirements. The No-Action Alternative represents baseline conditions that can be compared to conditions that would exist under the Proposed Action.

## 2.5 ALTERNATIVES CONSIDERED BUT NOT CARRIED FORWARD

Selection of alternatives for evaluation in this EA was based on criteria described in Section 2.2 for determining whether a potential alternative is reasonable (e.g., the ability to meet project objectives). As discussed in Section 2.3, no reasonable alternatives to the Proposed Action were identified or carried forward in the EA process.

## 2.6 ENVIRONMENTAL IMPACT ANALYSIS PROCESS

### 2.6.1 Public and Agency Involvement

The draft of this EA was submitted to the South Carolina State Clearinghouse for distribution and review by appropriate state and local agencies. In addition, copies of the Draft EA were sent directly to the South Carolina Department of Natural Resources, South Carolina Department of Health and Environmental Control (SCDHEC), City of Sumter, County of Sumter, and Catawba Indian Tribe. Copies were also provided to the South Carolina State Historic Preservation Office (SHPO) to obtain their consultation in regard to cultural resources and to the U.S. Fish and Wildlife Service (USFWS) for their consultation on biological resources (primarily for compliance with the Endangered Species Act). Appendix B contains copies of the consultation letters that accompanied the Draft EA when it was sent by Shaw AFB to these agencies and governments.

Shaw AFB published a newspaper advertisement in the August 15, 2004 edition of *The Item* announcing the availability of the Draft EA for public review at the Sumter County Library in Sumter, South Carolina. The public comment period extended from August 18 through September 17, 2004.

No comments were received from the public. Copies of responses received from state and federal agencies are provided in Appendix B. The agencies from which responses were received were the USFWS, SHPO, SCDHEC, and State Clearinghouse. The USFWS and SHPO concurred with the conclusions of this EA that the Proposed Action would not have adverse impacts on resources under their jurisdiction. The SCDHEC response did not comment on the conclusions of the EA but noted several permitting issues related to water quality that should be addressed when planning and constructing the proposed projects. The State Clearinghouse response stated that an intergovernmental review was conducted, but no comments were provided, indicating that none were received.

### 2.6.2 Regulatory Compliance

#### 2.6.2.1 NEPA Regulations

NEPA (Public Law 91-190; Title 42, U.S. Code, Section 4321-4347 [42 USC 4321-4347]) requires all agencies of the federal government to consider the environmental consequences of proposed major federal actions and to include these considerations in the decision-making process. Title II of NEPA created the CEQ to implement federal policy under NEPA. In 1978 the CEQ issued *Regulations For Implementing The Procedural Provisions Of The National Environmental Policy Act* (Title 40, Code of Federal Regulations, Parts 1500-1508 [40 CFR 1500-1508]), referred to as the CEQ Regulations.

The Department of the Air Force directed adherence to NEPA requirements in Air Force Policy Directive 32-70, *Environmental Quality*. This directive was implemented in 32 CFR 989, EIAP. This regulation provides instructions on procedures to achieve and

maintain compliance with NEPA and the CEQ Regulations in conjunction with the Air Force EIAP. It establishes policy, responsibilities, and procedures for integrating environmental considerations into Air Force planning and decision-making and for assessing the environmental effects of Air Force actions.

According to the CEQ Regulations and the Air Force EIAP, the purpose of an EA is to provide evidence and analysis sufficient to determine whether the Proposed Action may have significant effects that would require the preparation of an *Environmental Impact Statement* (EIS). If the assessment determines that the environmental effects will not be significant, a *Finding of No Significant Impact* (FONSI) is prepared. The EA aids the Air Force in complying with NEPA when an EIS is not required.

#### 2.6.2.2 Additional Regulatory Requirements

Federal, state, and local authorities have promulgated additional regulatory requirements potentially relevant to the Proposed Action.

### **Federal**

#### Air Quality

The Clean Air Act (CAA) establishes federal policy to protect and enhance the quality of the nation's air resources to protect human health and the environment. The CAA requires that adequate steps be implemented to control the release of air pollutants and prevent significant deterioration of air quality. The 1990 amendments to the CAA require federal agencies to determine the conformity of Proposed Actions to the State Implementation Plans (SIP) for attainment of air quality goals.

#### Water Resources

The Clean Water Act (CWA) of 1977 (33 USC 1344) and the Water Quality Act of 1987 (33 USC 1251, as amended) establish federal policy to restore and maintain the chemical, physical, and biological integrity of the nation's waters and, where attainable, to achieve a level of water quality that provides for the protection and propagation of fish, shellfish, wildlife, and recreation in and on the water. The U.S. Army Corps of Engineers (USACE) is the agency authorized to grant permits for impacts to the nation's waters.

*Executive Order (EO) 11990, Protection of Wetlands*, requires that federal agencies provide leadership and take actions to minimize or avoid the destruction, loss, or degradation of wetlands and to preserve and enhance the natural and beneficial values of wetlands.

#### Hazardous Material and Wastes

Hazardous materials and wastes are subject to regulation under the Solid Waste Disposal Act as amended by the Resource Conservation and Recovery Act (RCRA); the

Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA); The Toxic Substances Control Act (TSCA); the CWA; and the CAA.

### Biological Resources

The Endangered Species Act of 1973 (16 USC 1531 *et. seq.*) requires that federal agencies, in consultation with the USFWS and the National Marine Fisheries Service, use their authority to assist in carrying out federal programs for the conservation of threatened or endangered species. These agencies also ensure that any project that is funded, authorized, or constructed by the federal government is not likely to jeopardize the continued existence of such threatened or endangered species, or result in the destruction or adverse modification of their habitat. The USFWS reviewed the Draft EA and concurred that the Proposed Action is not likely to have reasonably foreseeable adverse effects on resources under their jurisdiction that are currently protected by the Endangered Species Act (see Appendix B).

### Cultural Resources

Actions that could affect cultural resources are regulated under Section 106 of the National Historic Preservation Act of 1966 and the Advisory Council on Historic Preservation's Regulations for compliance with Section 106 codified as 36 CFR Part 800. These regulations require that the effects of federal actions on cultural resources be considered and minimized. The SHPO, which is responsible under the Act and regulations for preservation of cultural resources in South Carolina, concurred that there will be no effect on cultural resources by the Proposed Action (see Appendix B).

## **State and Local**

### Soils

Stormwater Management and Sediment Reduction Act of 1991 was enacted to reduce the adverse effects of stormwater runoff and sediment and to safeguard property and the public welfare by strengthening and making uniform the existing stormwater management and sediment control program. The Act promulgated regulations (R.72-300) that apply to land-disturbing activities on all lands except State-owned lands. This program is administered by the SCDHEC, Bureau of Water.

### Hazardous Materials and Wastes

Under the "Underground Storage Tank (UST) Control Regulations" (R.61-92), SCDHEC, Bureau of Land and Waste Management, notification of various activities regarding USTs is required.

Hazardous materials and wastes are regulated under the RCRA and the South Carolina Hazardous Waste Management Act. The SCDHEC, Bureau of Land and Waste Management, issues permits that identify and specify wastes and associated management



practices that may be handled in accordance with the South Carolina Hazardous Waste Management Regulations (R.61-79).

Building demolition or renovation projects may disturb asbestos-containing materials. Such disturbances can result in the production of asbestos-containing dust that may contaminate a structure and are regulated by the SCDHEC, Bureau of Air Quality/Asbestos Section. Regulations pertinent to renovation and demolition activities include federal procedures (40 CFR 763) and SCDHEC Regulation 61-86.1. SCDHEC adopted the National Emission Standards for Hazardous Air Pollutants (NESHAP) relating to asbestos demolition and renovation by reference. These requirements may be found at 40 CFR 61, Subpart M – National Emission Standard for Asbestos (40 CFR 61, 141-157).

### Water Resources

The Watershed Water Quality Management Strategy was implemented in 1991 by SCDHEC to protect and improve South Carolina's surface water resources. The management strategy coordinates monitoring, assessment, water quality modeling, planning, permitting, and other SCDHEC initiatives by basin. Shaw AFB is located within the Catawba and Santee Basins.

The Clean Water Act of 1972 initiated strict control of wastewater discharges with responsibility of enforcement given to the Environmental Protection Agency (EPA). The EPA then created the National Pollutant Discharge Elimination System (NPDES) to track and control point sources of pollution. The primary method of control is by issuing permits to dischargers with limitations on wastewater flow and constituents. The EPA delegated permitting authority to the State of South Carolina, which permits stormwater discharges under Regulation 61-9.

Section 401 of the CWA requires each state to certify that state water quality standards will not be violated for activities that either involve issuance of a federal permit or license, or require discharges to Waters of the United States. The USACE cannot issue a Section 404 permit until a 401 certification is issued. This certification is issued by the SCDHEC, Bureau of Water.

### Biological Resources

Animals with a state designation of endangered or threatened are granted legal protection by the state of South Carolina, based on the South Carolina Nongame and Endangered Species Conservation Act (Title 50, Chapter 15 of the 1976 South Carolina Code of Laws updated through the 2003 Session of the General Assembly).

#### 2.6.3 Permit Requirements

This EA has been prepared in compliance with NEPA; other federal statutes, such as the CAA and the CWA; EOs; and applicable state statutes and regulations. Table 2-2

summarizes existing federal, state, and local permits and the potential for change to these permits due to the proposed WINDO projects as well as new permits that may be required for the WINDO projects.

During the course of this EA, a list of existing Shaw AFB permits was compiled and reviewed. In addition to this EA being prepared for the decision maker and the interested public, it is also a tool for Air Force personnel to ensure compliance with all regulatory requirements from proposal through project implementation.

## 2.7 COMPARISON OF ALTERNATIVES

The purpose of this section is to summarize and compare the environmental impacts of each alternative, thereby defining the issues and providing a clear basis for choice among the alternatives by the decision-maker. The environmental resources potentially affected by the alternatives are described in Chapter 3, Affected Environment. The consequences for each of these environmental resources from the implementation of each alternative are described in Chapter 4, Environmental Consequences. The present section discusses and provides a tabular matrix (Table 2-3) that summarizes the conclusions reached in Chapter 4.

In Chapter 4, impacts on each environmental component are evaluated to determine whether the impact would be beneficial or adverse. For adverse impacts, the level of impact on the resource is estimated (e.g., negligible, low, moderate, high) and considered in conjunction with the context (e.g., local versus regional, short-term versus long-term) and intensity (based on ten criteria provided in the CEQ Regulations) of the effect in determining whether the impact is significant. The conclusions of the evaluation are summarized in Table 2-3. As shown in the table, no potentially significant adverse impacts were identified for either the Proposed Action or the No-Action Alternative.

It is the conclusion of this EA that implementation of the Proposed Action would not result in a significant adverse effect on the human environment. Therefore, preparation of a FONSI is appropriate for this action, and preparation of an EIS is not required.

**Table 2-2. Environmental Related Permitting for the WINDO Projects**

Subject:	Air	Asbestos		Wastewater	Drinking Water	Storm Water	Storm Water Pollution Prevention Plan		Hazardous Waste		Laboratory
Permit <sup>1</sup> :	Construction	Demolition	Removal	Shaw AFB NPDES Waste Water Treatment	Construction	Construction <sup>2</sup>	Sedimentation and Erosion Control	Shaw AFB NPDES Storm Water	Shaw AFB Poinsett ECR Subpart X Permit	Lead-Based Paint Abatement	Laboratory Certification
Project Number											
VLSB960053					X	X	X				
VLSB010057					X	X	X				O
VLSB030214A						X	X				
VLSB010030						X	X	O			
VLSB970014	X			O	X	X	X				
VLSB010031	X	X	X		X	X	X	O		X	
VLSB960022	X				X	X	X		O		
VLSB040017	X				X	X	X				
VLSB020042						X	X				
VLSB040055											
VLSB020043					X	X	X				
VLSB020048											
VLSB020045											
VLSB010080					X	X	X				
VLSB020047						X	X				
VLSB983002R3	X	X	X		X	X	X			X	
VLSB043001R1	X				X	X	X				

NOTE:1 = No change would be needed for the following permits:

Air: Title V Operating

Water: Shaw AFB Drinking Water  
Poinsett Drinking Water

Wastewater: Wateree NPDES Wastewater  
Shaw AFB Non-Discharge (Sludge Disposal)  
Septic Tanks at Shaw and Poinsett

Hazardous Waste: Shaw AFB Hazardous Waste Permit

USTs: UST Registration Certification  
UST Monitoring Well

2 = Permit for construction sites disturbing more than 1 acre.

X = New permit needed.

O = Permit change potentially needed.

NPDES = National Pollutant Discharge Elimination System

UST = Underground storage tank

**Table 2-3. Summary of Potential Environmental Consequences**

<b><i>Resources</i></b>	<b><i>Proposed Action</i></b>	<b><i>No-Action Alternative</i></b>
Land Use / Transportation	+ / +	○ / –
Infrastructure	+	○
Socioeconomics / Environmental Justice	+ / ○	○ / ○
Cultural Resources	○	○
Biological Resources	–	–
Water Resources	–	–
Air Quality	○	○
Hazardous Materials and Waste Management	○	–
Safety	+	–
Noise	○	○

Consequences:

- + = Beneficial.
- = No net change or not discernible.
- = Adverse but not significant.





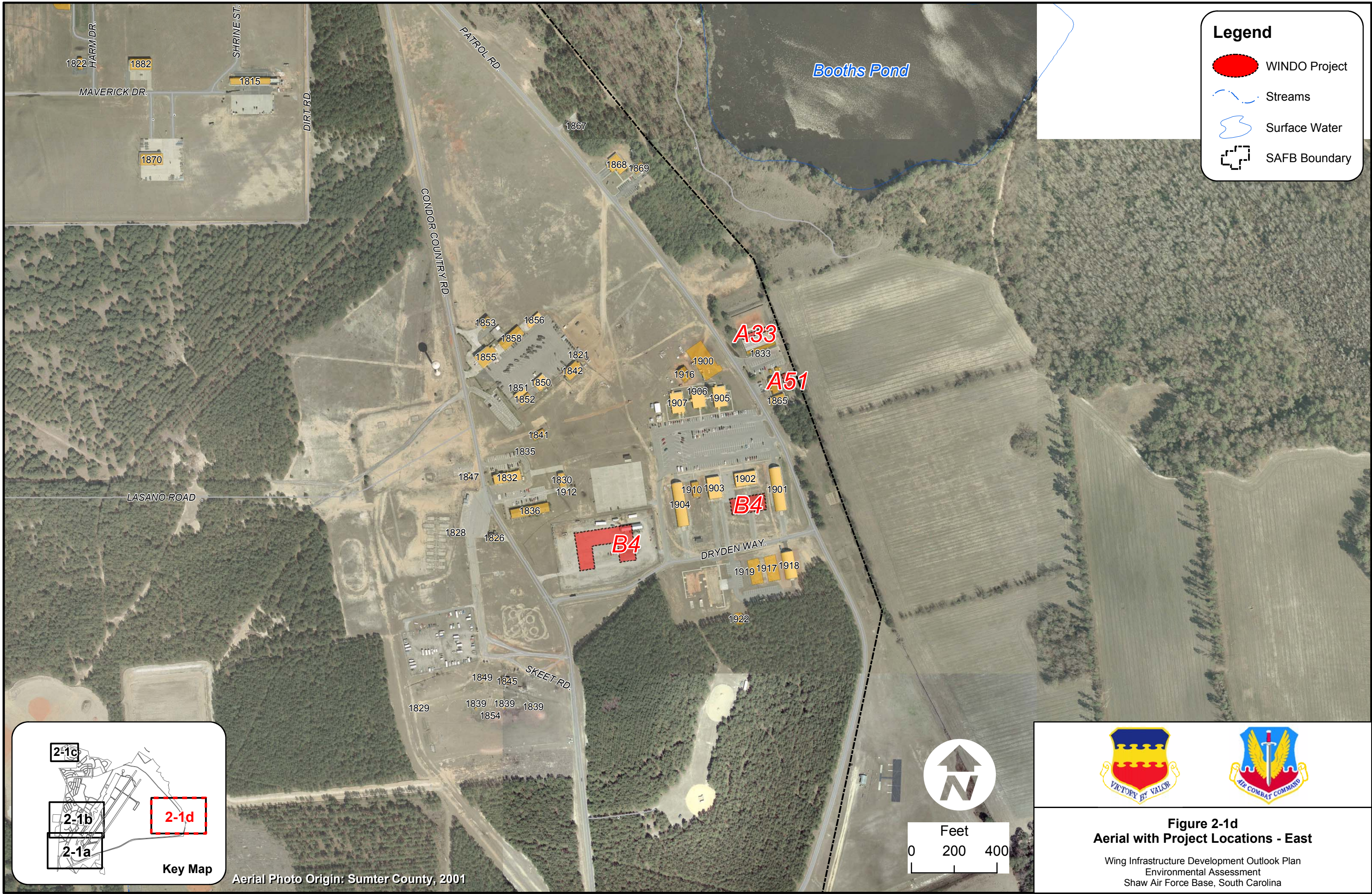


















### **3.0 AFFECTED ENVIRONMENT**

#### **3.1 LAND USE RESOURCES**

Land use resources include land use, transportation, and visual resources. Land use focuses on the existing and planned future land use on Shaw AFB and in surrounding areas. Transportation includes the road and rail networks providing access between the local community and the base, as well as within the base. Visual resources include any natural or human-modified features on-base or within view from the base that contribute to the aesthetic qualities of the base.

##### **3.1.1 Land Use**

Shaw AFB occupies 16,718 acres of federally owned or leased land in Sumter County (Figure 1-1). (Another 24 acres, the Wateree Recreation Area, is located 37 miles northwest of the main base in Kershaw County. This auxiliary facility is not addressed in the EA.) The main cantonment area of Shaw AFB encompasses 3,354 acres and is located within the western boundary of the city of Sumter, approximately 10 miles west of the downtown area (SAFB 1999). The southern boundary of the base is bordered by a major commercial business and retail corridor along U.S. Highway 76/378 (US 76/378) (SAFB 1999). There is also a mining operation to the south of the base (SCCPC 1994). The western boundary of the base is bordered by State Route 441 (SR 441), another commercial corridor highway, and housing ranging from low to high density (SAFB 1999). The northern and eastern boundaries are adjoined by high density residential and agricultural uses. Along the eastern border of the base, there are privately owned farmland and undeveloped woodland (SCCPC 1994). Figure 3-1 presents existing land use adjacent to Shaw AFB.

Poinsett ECR, which covers 13,364 acres, is an auxiliary facility of Shaw AFB. The range is located 15 miles south of the base, along the eastern side of SR 261. Poinsett ECR is bounded on the west and south by public and private land which contains a state park, scattered low density residential units, churches and other institutional buildings, South Carolina Highway 261, and the town of Pinewood. To the east of the range, land uses include mixed residential development, churches, commercial properties, and agricultural and vacant land. Low density residential areas, a public park, and agricultural uses are located to the north of the range (SCCPC 1994).

Shaw AFB contains a variety of land uses that support the mission of the 20th FW and associate units at the base, as illustrated in Figure 3-2 (SAFB 1999). The airfield and aircraft operations and maintenance facilities, which together account for nearly 40 percent of the total base area, are located approximately in the center of the base, and bisect the middle of the installation in a northeast-southwest direction. The majority of the remaining developed land uses are located north and west of the airfield. The east side of the base has much less development and contains the majority of the open space.

Most administration areas are located in the core of the developed area of the base (west of the airfield) as are most of the community support areas, the medical complex, and the unaccompanied housing. The accompanied housing and public schools are located in the northwest portion of the base. There is a 150-acre golf course located between the residential area and the flightline, with other outdoor recreation areas on the west and east sides of the base. Industrial areas are concentrated in the southwest corner of the installation and on the east side of the base (including a munitions storage area). The majority of the undeveloped land (open space) is on the east side of the base, southeast of the airfield. Overall, open space occupies approximately 25 percent of the base land area. Poinsett ECR is predominantly open space, with the exception of the administrative area, which is located in the northern section of the range and contains the administrative building and support facilities (SAFB 1999).

Plans and programs have been adopted at Shaw AFB to provide land use recommendations for on-base development and are used to assist on-base officials and local community leaders in making compatible development decisions. Planning for future land use on Shaw AFB is provided in the Shaw Air Force Base General Plan (SAFB 1999). The Land Use Component Plan, contained within the General Plan, details base mission, evaluates existing land use and functional relationships, and provides guidance on land use changes that are required to meet future needs. Figure 3-3 presents the future land use for Shaw AFB, which defines the boundaries of the future land use areas planned for the base. Five Area Development Plans (ADPs) and a Housing Community Plan have been developed for Shaw AFB, covering different areas of the installation (SAFB 1999). The area east of the airfield is the largest developable area on the installation. The Eastside Development Master Plan identifies a development scheme for this area, which is mostly forested, with the primary recommendations being the reduction of open space to accommodate airfield, aircraft operations and maintenance, industrial, and outdoor recreation activities.

The Air Installation Compatible Use Zone (AICUZ) Study (USAF 1994) for Shaw AFB recommends compatible land development in off-base areas in an effort to protect local citizens from aircraft noise exposure and accident potential associated with flying activities as well as to prevent degradation of the Air Force's capability to achieve its mission by promoting compatible land use planning. Shaw AFB and Sumter County have prepared a Joint Compatible Land Use Study (JCLUS) (SCCPC 1994) that incorporates the AICUZ recommendations with regard to land use and development. The JCLUS also describes existing land uses; identifies encroachment areas around the base and Poinsett ECR; recommends modifications to the county zoning ordinance; addresses long-range infrastructure improvements; and describes 20-year growth trends for the area. Since the publication of the JCLUS, Sumter County has adopted new ordinances to limit future development within the noise zones and Accident Potential Zones (APZs) bordering the base (SAFB 1999).

### 3.1.2 Transportation

Vehicles enter and exit the base through five security checkpoints: the Main Gate on Shaw Drive, the Polifka Street Gate, the Frierson Street Gate, the Palmetto Heights Residential Gate on Sycamore Street, and the North Gate on Frierson Road (Byer 2004a). The General Plan (SAFB 1999) notes that long range plans for development of the eastern portion of the base will require the improvement of existing roads and the addition of a new gate at the intersection of the extended Condor Country Road and US 76/378. The on-base streets are classified as arterials, collectors, or local streets. The arterials, those streets that carry the majority of traffic, are Polifka Drive, Rhodes Avenue, and Shaw Drive. Six collectors (Condor Country Road, Killian Avenue, Lance Avenue, Patrol Road, Stuart Street, and Sweeney Street) distribute traffic from the arterials to the local streets or directly to intended destinations. The major arterial highway in the area is US 76/378, which borders Shaw AFB on the south and provides access to the Interstate Highway system (SAFB 1999). At Poinsett ECR, a paved access road leads from SR 261 to the administrative area.

There is a 5-mile rail spur that is used to move petroleum, oil, and lubricant (POL) tank cars from the CSX siding to the POL off-load area (SAFB 1999).

### 3.1.3 Visual Resources

Shaw AFB is characterized by a variety of landscape components primarily consisting of those human-modified features associated with the operation of a military installation. The main cantonment acreage includes runways, buildings, roadways, parking lots, lawns, golf course greens and fairways, athletic grounds, and open space. Additionally, there are four ponds (including Memorial Lake) and two streams located within the outdoor recreation areas and the open space area (SAFB 1999).

Approximately 160 acres of undeveloped, forested land still exist on Shaw AFB (SAFB 1999). This area is located along Spann Branch and Long Branch adjacent to the northern and eastern border of the base. It consists of mature trees, including native oak, pine, maple, and dogwood, as well as a multitude of shrubs and ground covers native to the area. A pine plantation of more than 300 acres is located east of the runways along the southeastern border of the base (SAFB 1999). The trees in this area are approximately 30 years old and enhance the aesthetic qualities of the base as well as provide a buffer between the base and the highway to the south.

Most of Poinsett ECR is wooded, with almost half (6,000 acres) covered by pine plantations. The administrative area is in the northern part of the range within a large cleared area (unvegetated sand fields) that contains the strafing target areas.

## 3.2 INFRASTRUCTURE

The infrastructure of Shaw AFB includes utilities systems (electrical and natural gas, potable water, wastewater, solid waste collection, storm drainage, heating and cooling,

and liquid fuels) and the communications system. The capacities of the major utility systems on Shaw AFB are summarized in Figure 3-4.

### 3.2.1 Electrical and Natural Gas Systems

Shaw AFB purchases power from two public utility companies through two feeder lines. The Carolina Power and Light Company (CP&L) provides electricity to the main cantonment area and the majority of the housing area. The Black River Electric Cooperative (BREC) supports the remaining housing and southeastern portion of the base. The BREC also provides emergency backup power for the main base. The total capacity of the electrical system is 28 megawatts and current usage is approximately 16 percent at peak periods (SAFB 1999). Either company has the capacity and the capability to meet all electrical power requirements for the installation. A third feeder line is available from BREC, but there is not a load connection at this time. The on-base distribution system for 905 units of the family housing is owned and maintained by the CP&L. The BREC owns and maintains the distribution system for 799 military family housing units. Electricity is supplied to the administrative area at Poinsett ECR.

Natural gas is supplied to the base by the Carolina Pipeline Company via a 4-inch pipeline that enters the base at the junction of Sweeney Street and Frierson Road. A metering station divides the supply between the housing and industrial areas on the western portion of the installation. Natural gas is not currently supplied to facilities on the east side of Shaw AFB. The natural gas system has a capacity of 150,000 cubic feet per day and is currently 21.5 percent utilized (SAFB 1999).

### 3.2.2 Potable Water System

Shaw AFB operates an internal water system for the entire base. Treated water for the main cantonment area and the family housing areas is provided by six on-base government-owned wells through 34 miles of water mains. These wells have a capacity to provide 3.3 million gallons per day (mgd), based on a standard 16-hour pumping day. Average daily consumption is 1.5 mgd with peak demands at 2 mgd (SAFB 1999). The water is treated with sodium hexametaphosphate, chlorine, fluorine, and soda ash at each well site prior to storage in one of three aboveground storage tanks.

The total storage capacity for potable water is 910,000 gallons. In addition, there are two ground level storage tanks providing 1 million gallons of potable water to support the fire protection system. An additional well has been drilled to provide non-potable water for irrigation. Water from this well is fed into Pond No. 1, located on the golf course.

The water system on base also has two interconnections with the High Hills Rural Water Company and one interconnection with the City of Sumter Water System. These interconnections are rarely used and are intended for emergencies. At Poinsett ECR, potable water is obtained from an on-site well.

### 3.2.3 Wastewater System

Shaw AFB discharges domestic and industrial wastewater to an on-base WWTP that was constructed in the 1940s. A contractor operates the plant. Five lift stations move the wastewater from the main cantonment and housing areas to the WWTP. The treated water is discharged via a 24-inch gravity sewer line off base into Beech Creek and eventually flows into the Wateree River (NPDES permit No.SC0024970). Construction of an extension to the Shaw AFB WWTP sewer line outfall from its existing discharge into Beech Creek to a new location on the Wateree River is planned. This project would allow the base to meet current discharge limits for copper due to the higher flow of the receiving stream.

The WWTP has a rated capacity of 1.2 mgd with an average daily flow of 0.8 mgd, and a one time peak flow of 1.2 mgd generated by excessive rainfall (SAFB 1999). An equalization basin has been constructed to accommodate heavy flows due to rainfall and several projects to eliminate piping cross connections and infiltration have been completed. This includes replacing lines throughout the base to reduce infiltration and inflow into the system, thereby lowering peak flows. Other improvements include replacement of some of the lift pump stations and expansion of the sewer system to the east side of the base. The facilities on the east side of the base and the administrative area at Poinsett ECR are currently supported with septic tanks to process wastewater (SAFB 1999).

The sludge from the treatment plant is thickened and treated with three aerobic digesters and then stabilized with lime. It is then hauled off-base for disposal (Behr 2004a).

### 3.2.4 Solid Waste Disposal

Shaw AFB contracts with a private service to remove the solid waste from the base. In FY 2003 the base disposed of 3,848 tons of solid waste (SAFB 2004b). The base has an active recycling and reuse program to reduce the amount of solid waste that is transported to the landfill. Shaw AFB does not compost yard waste or other similar materials due to the small size of the base. Composting is not allowed within two miles of the flightline because of the risk of attracting birds (Hall 2004).

Construction and demolition waste is hauled to the Sumter County Landfill, located approximately 18 miles from the base. This landfill is currently projected to reach capacity within 20 years. All other solid waste is hauled to a landfill located in Bishopville, South Carolina (Hall 2004).

### 3.2.5 Storm Drainage System

The storm drainage system at Shaw AFB consists of a pattern of drainage pipes, ranging in diameter from 12 to 72 inches, and open swales. Drainage from the housing areas is channeled into three lakes located on the golf course. Water from these lakes is used for irrigation (SAFB 1999). Stormwater runoff from the base is regulated by SCDHEC and

the NPDES permit program. Under the base NPDES permit (No. SC0024970), stormwater is discharged through four permitted outfalls. This permit became effective on April 23, 2003 and will expire on May 31, 2008. No storm drainage outfalls exist on Poinsett ECR.

The NPDES permit authorizes the Air Force to discharge stormwater to the following outfalls and receiving waters: Outfalls 002 and 004 collect stormwater from the area east of the airfield and discharge to Long Branch; Outfall 003 collects stormwater from the areas in the center of the base and south of the airfield, Outfall 007 collects stormwater from the areas in the center of the base and west of the airfield, and both Outfalls 003 and 007 discharge to Mush Branch (Singleton 2004). Long Branch and Mush Branch eventually flow into the Pocotaligo River east of the base.

In addition, there are two outfalls (005 and 006) that discharge to Long Branch and Booth's Pond, respectively. These two outfalls collect stormwater from the area east of the airfield and do not require permitting.

### 3.2.6 Heating and Cooling Systems

A single gas-fired, central heating plant provides heat to 22 buildings on base, including the dormitories in the 400 area and most of the buildings in the 900 area. The system can be switched to a 10,000 gallon #2 diesel fuel backup if necessary. Individual dedicated units provide heating and cooling for all other base buildings, including the administrative building at Poinsett ECR. Individual heat exchangers provide heating and cooling to family housing units.

### 3.2.7 Liquid Fuels System

All jet fuels are transported to the base by rail. A tank car siding capable of handling ten tank cars simultaneously is located adjacent to the three jet fuel storage tanks. These tanks have a combined storage capacity of 2.4 million gallons and are connected to a flightline hydrant refueling system. Three other tanks, capable of holding 12,000 gallons each, are available for unleaded gas, leaded gas, and diesel fuel. These products are delivered to the base storage area and then on to the military service station by tank trucks.

### 3.2.8 Communications System

The Command, Control, Communications, Computers, and Intelligence Blueprint for Shaw AFB identifies existing communications and information systems, shortfalls, planned improvements, and transitional and implementation plans (SAFB 2004c). Communications systems at the base include information transfer, telephone switching, data communications, long haul communications, and radio and security systems. Shaw AFB maintains a high capacity digital data network using single mode and multimode fiber optics that provides secure networking, electronic messaging (e-mail), and other services (SAFB 1999). The current telephone switching system fully supports switching

needs for mission changes, dial-up local area networks, and additional beddowns, and it has ample trunking expansion capacity.

The Shaw AFB data system network includes classified and unclassified data systems essential to operations of the 20th FW, HQ 9thAF/CENTAF, and tenant units. Recent upgrades include implementation of the Theater Battle Management Core System Unit Level and the Base Information Protection Firewall System. Long haul communications systems on Shaw AFB interconnect the voice and data systems with the wide area voice and data networks. These systems are routinely evaluated and improved as new technology becomes available. The Shaw AFB radio system consists of a Land Mobile Radio network and very high frequency and ultra high frequency radios. These systems, which are vital for tactical control of aircraft, are all in excellent condition. The base also has a flight line video surveillance system and a video teleconferencing system (SAFB 2004c).

### 3.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

The socioeconomic resource areas potentially affected by the Proposed Action include population, employment and earnings, and community facilities. The Shaw AFB region of influence (ROI) addressed is Sumter County, South Carolina. Environmental justice, which concerns the disproportionately high or adverse effects of an action on minority and low-income populations, must be considered for federal actions under the NEPA review process.

#### 3.3.1 Socioeconomics

The following sections describe the socioeconomic conditions of Shaw AFB and the surrounding area, which includes the City of Sumter and Sumter County. Where appropriate, comparisons are made with conditions for the State of South Carolina.

##### 3.3.1.1 Population

Shaw AFB is located 10 miles west of downtown Sumter, in the center of Sumter County. Sumter is the largest city in Sumter County and the county seat. In 2000, the city of Sumter had a population of 40,213 and Sumter County had a population of 104,646 (US Census Bureau 2004). Shaw AFB supports a total of 17,715 people. Of this total, 5,460 people are classified as Appropriated Fund military, 11,111 are classified as active duty military dependents, 465 are classified as Appropriated Fund civilians, and 679 are classified as Non-Appropriated Fund contract civilians and private business. Of the 5,460 Appropriated Fund military, 2,259 live on base and 3,201 live off base. Of the 11,111 active duty military dependents, 4,518 live on base and 6,593 live off base (SAFB 2001a).

The county and city have not experienced much growth over the past 10 years. According to the 2000 Census, there has been about a 1 percent increase in the population of the City of Sumter and Sumter County since 1990. However, the South Carolina



population increased by 15 percent during the same time period. It is not practical to predict population growth at the base; as with many military installations, Shaw AFB experiences shifts in population based on mission changes, deployments, and other operational considerations.

Population by race for the City of Sumter, Sumter County and South Carolina is presented in Table 3-1.

**Table 3-1. Population by Race (2000)**

	South Carolina	Sumter County	City of Sumter
<b>Total Population</b>	4,012,012	104,646	40,213
<b>Racial Composition</b>			
White	66.2%	49.5%	49.1%
African American	29.3%	46.6%	46.1%
Hispanic or Latino	2.3%	1.6%	1.9%
Other	2.2%	2.3%	2.9%

Source: U.S. Census 2000 (US Census Bureau 2004)

### 3.3.1.2 Employment and Earnings

Employment information is provided in Table 3-2. According to the 2000 Census, Sumter County and the City of Sumter exhibit similar employment rates as those seen throughout the State. The percentage of the population employed by the armed forces is considerably higher in the City of Sumter and the County than in the State as a whole, as expected with Shaw AFB contributing to the city and county employment. The state unemployment rate was lower than that of the county or city.

**Table 3-2. Labor and Employment (2000)**

	South Carolina	Sumter County	City of Sumter
<b>Total Labor Force*</b>	1,974,222	48,696	18,569
<b>Composition</b>			
Civilian Employed	92.5%	84.9%	76.9%
Armed Forces	1.8%	8.1%	15.0%
Unemployed	5.7%	7.0%	8.1%

\*Population 16 years and over

Source: U.S. Census 2000 (US Census Bureau 2004)

The 1999 median household income for South Carolina was \$37,082; it was \$33,278 for Sumter County, and \$31,590 for the City of Sumter. Slightly fewer than 19 percent of households in the State were living below the poverty level (\$15,260 for a family of

three). The percentage of households with incomes below the poverty level was 21.1 in Sumter County and 22.8 in the City of Sumter.

Sumter County has historically been an agricultural community. However, recently it has developed a strong manufacturing base and retail trade sector. Based on the 2000 census, the largest type of industry in South Carolina and Sumter County is manufacturing (19.4 and 23.7 percent, respectively). In the City of Sumter education, health, and social services are the largest employers (23.8 percent).

The proximity of Shaw AFB to Sumter is an important factor in the development and prosperity of the city. The total amount paid for annual payroll for Shaw AFB in Fiscal Year (FY) 2001 was \$248.1 million, and almost 90% of this amount was paid to military personnel. The total FY2001 annual expenditure for Shaw AFB was \$47.1 million. Of this total, 51.9% was spent on construction on base, 34.0% was spent on services for the base, and 15.4% was spent on other materials, equipment, or supplies not included in construction and services. The remaining annual expenditure was spent on health, education, and the commissary. The services contracts include only those contracts in the local economic area or contracts requiring the use of locally supplied goods and services. Approximately 2,075 indirect jobs have been created due to the presence of the base, with a total annual dollar value estimated at \$53 million for FY2001. Considering the annual payroll for Shaw AFB, the annual expenditures, and the estimated annual dollar value of indirect jobs created, the total annual economic impact of Shaw AFB in FY2001 was estimated to be more than \$348 million (SAFB 2001a).

### 3.3.2 Environmental Justice

Environmental justice must be considered for federal actions under the NEPA review process, and in accordance with the Air Force EIAP (32 CFR 989.33). Executive Order 12898, *Federal Actions to Address Environmental Justice in Minority Populations and Low-Income Populations* (issued February 11, 1994) requires that each Federal agency shall make achieving environmental justice part of its mission by identifying and addressing, as appropriate, disproportionately high or adverse human health or environmental effects of its programs, policies, and activities on minority and low-income populations. A Presidential Memorandum directed to the heads of all federal departments and agencies, which recognized the importance of utilizing existing federal statutes and regulations, accompanied the Executive Order. The Memorandum states "each Federal agency shall analyze the environmental effects, including human health, economic, and social effects of Federal actions, including effects on minority communities and low-income communities, when such analysis is required by NEPA."

Environmental justice analysis focuses on residents living within the areas where there would be potentially adverse environmental impacts, which for the purposes of this EA are those areas bordering Shaw AFB. Data collection efforts involving the identification of minority and low-income populations that might be affected by implementation of the proposed action or alternatives are central to the identification and consideration of environmental justice issues. The 2000 U.S. Census of Population and Housing reports numbers of residents having minority and poverty status. Minority populations included

in the census are identified as Black; American Indian, Eskimo, or Aleut; Asian or Pacific Islander; Hispanic; or Other. Poverty level is determined by the census using a set of money income thresholds that vary by family size and composition to determine poverty status. If the total income for a family or unrelated individual falls below the relevant poverty threshold, then the family or unrelated individual is classified as being “below the poverty level.” For the purposes of this EA, low-income populations are considered to be the percent of population for all ages for whom poverty status has been determined by the U.S. Census Bureau.

The census tracts bordering the base are tracts 2.01, 2.02, and 18.02 (Figure 3-5). Tract 2.01 is located west of the base, tract 2.02 is north and east of the base, and tract 18.02 is south of the base across US 76/378. In 1999, 6% of the population was living below the poverty level in tract 2.01, 13.6% in tract 2.02, and 20% in tract 18.02. In the same year, 13% of the population was living below the poverty level in Sumter County. In 1999, 45% of the people living in census tract 2.01 were considered minority populations, 46.8% in tract 2.02, and 59.4% in tract 18.02, while 50.5% of the people living in Sumter County were considered minority populations. In the state of South Carolina, 10.7% of the population was living below the poverty level, and 33.8% of the people living in the state were considered minority populations.

### 3.4 CULTURAL RESOURCES

Cultural resources include prehistoric and historic sites, structures, artifacts, districts or any other physical evidence of human activities considered important to a culture or community for scientific, traditional, religious, or other reasons. Cultural resources include prehistoric and historic archaeological resources, as well as architectural resources. Prehistoric archaeological resources are evidences of human activity that predate the advent of written records in the region. Historic archaeological resources include campsites, roads, battlegrounds, and other resources from the period of recorded history in the region. Architectural resources include structures or districts of historic or aesthetic significance, such as buildings, bridges, and dams. To be considered for protection, such architectural structures normally must be more than 50 years old. However, more recent structures, such as those constructed during the Cold War era, may warrant protection if they manifest the potential to gain significance in the future. Traditional resources are identified by Native American tribes or other groups and include properties of religious or cultural importance to an Indian tribe or Native Hawaiian organization.

According to the National Historic Preservation Act of 1966, all of the cultural resources described above may be considered historic properties. Section 106 of the Act, as amended, requires federal agencies to take into account the effects of their actions on historic properties. Historic properties are cultural resources that are listed in, or eligible for listing in, the National Register of Historic Places (NRHP). Once a resource is NRHP-listed, or designated as eligible or potentially eligible for listing, the federal agency must consult with the SHPO and submit a pre-construction notification to the USACE for permitting before proceeding with a project that may potentially impact the

resource. Eligibility evaluation is the process by which resources are assessed relative to NRHP significance criteria for scientific or historic research, for the general public, and for traditional cultural groups. Under federal law, impacts to cultural resources may be considered adverse if the resources have been determined eligible for listing in the NRHP or have significance for Native American groups (SAFB 2001b).

AFI 32-7065, *Cultural Resources Management*, mandates that Shaw AFB maintain a current and approved *Cultural Resources Management Plan* (CRMP) of appropriate scope. The CRMP primarily assigns responsibility for carrying out cultural resource compliance on Shaw AFB, contains an inventory and evaluation of known cultural resources on Shaw AFB, identifies the potential for other cultural resources, and contains standard operating procedures to implement the CRMP.

The CRMP is reviewed and updated by the installation annually and integrated into the *Base Comprehensive Plan* (BCP). The CRMP is then approved by Shaw AFB's Major Command every five years. The South Carolina SHPO is given an opportunity to review and comment on the plan. Once the CRMP is adopted, a Programmatic Agreement is signed by the SHPO and the Advisory Council on Historic Preservation and serves to eliminate the need for consultation on a case-by-case basis for some base activities as related to cultural resources. The 2001 Shaw AFB CRMP was the primary source of information used in this assessment.

#### 3.4.1 Architectural Resources

Shaw AFB and Poinsett ECR have 23 architectural resources, 21 of which have been determined to be ineligible for the NRHP due to extensive modification and renovation (SAFB 2001c). However, following consultation with the SHPO, two have been declared eligible for inclusion in the NRHP: B611, a hangar located on the Shaw AFB flightline, and the Rosemary Fire Tower at the Poinsett ECR (SAFB 2001c). B611 is historically significant as an important example of a form of industrial construction that occurred during the World War II. It was built in 1942 and is located near the southern end of the flightline (Figure 3-6). The Rosemary Fire Tower was constructed in 1934 by the Civilian Conservation Corps and was one of the first forest fire detection towers built in South Carolina. The tower is located near the western boundary of the Poinsett ECR, near the intersection of Red Road and Highway 261, and approximately 2 miles south of the administrative area of the range.

#### 3.4.2 Archaeological Resources

All of Shaw AFB and Poinsett ECR have been surveyed for archaeological resources. No archaeological resources have been identified on Shaw AFB. All eligible or potentially eligible sites are located on Poinsett ECR, except for one potentially eligible site FS-1 that is located on the northern bank of Long Branch on the northern boundary of Shaw AFB (New South Associates 2003). Of the 133 sites on Poinsett ECR that have been assessed for eligibility, 21 are eligible for listing in the NRHP and 25 are potentially

eligible (New South Associates 2003 and SAFB 2001c). In addition, three sites at Shaw AFB have been identified but have not been assessed for eligibility (SAFB 2001c).

#### 3.4.3 Traditional Resources

No traditional resources have been identified on Shaw AFB lands (SAFB 2001c). A reconnaissance survey of Cold War-era resources at Shaw AFB resulted in the examination of one resource, a documentary collection, which was selected for documentation and evaluation (SAFB 2001c). The Catawba Indian Nation, the federally-recognized tribe closest to Shaw AFB, is located approximately 90 miles northwest of the base near Rock Hill, South Carolina. It has not identified traditional resources on Shaw AFB or Poinsett ECR (SAFB 2001c).

#### 3.4.4 Summary of Cultural Resources

There are no NRHP-listed cultural resources at Shaw AFB (NRHP 2004). However, there is one architectural site that is eligible for listing on the NRHP (Hangar B611) and three archaeological sites that have not been evaluated for eligibility for listing. All other cultural resources are located on Poinsett ECR in areas well removed from the proposed location for construction of the Administrative Facility in the existing administrative area.

### **3.5 BIOLOGICAL RESOURCES**

The biological resources potentially affected by the Proposed Action are the plants, animals, and other biota in the vicinity of the proposed projects (i.e., on Shaw AFB, as well as in the northernmost part of Poinsett ECR near the administrative facility). The biota of a particular area may be considered to compose an ecological community. The community is used as an organizational concept in ecology and is employed below in describing the biological resources of the study area based on terrestrial and wetland/aquatic communities. In addition, the potential for rare species to occur within these communities is discussed.

#### 3.5.1 Terrestrial Communities

Temperate Coniferous Forest is the major habitat type native to the region. Within this major habitat type, the ecoregion encompassing the area of the base and extending to the coast is classified as Middle Atlantic Coastal Forest (Ricketts et al. 1999). This native forest has historically been cleared in the majority of the study area, and the landscape has been altered and developed.

Most of the area within Shaw AFB has been extensively disturbed in the past, and few natural communities remain. Consequently, the predominant ecological community on the base, which covers approximately 84 percent of its area, has been classified as disturbed/urbanized. The other terrestrial community types identified on Shaw AFB, and their approximate percentage coverage of the base, are: pine plantation (13%) and

oak/hickory forest (<1%) (SAFB 2001d). These terrestrial community types are discussed below.

Disturbed/urbanized - Most of the grounds on Shaw AFB that are not covered by buildings or pavement are semi-improved to improved and are intensively landscaped and maintained. The vegetation within these areas consists principally of lawn grasses and ornamental shrubs and trees. Examples of the animal species likely to occur within this community include the cottontail, mockingbird, American robin, and crow.

At the Poinsett ECR, only a small percentage of the landscape is maintained, including the areas around the Administration Facility, maintenance facilities, and observation towers. The ecological community in these areas, including the proposed location of the Administration Facility, has been disturbed and has characteristics similar to those of the disturbed areas on Shaw AFB.

Pine Plantation - This community occupies over 300 acres in the southeastern corner of Shaw AFB, providing a buffer between the base and the highway (US 76/378). The planted trees consist primarily of loblolly pines that are approximately 30 years old, 40 feet tall, and planted on a 10-by-10-foot or 8-by-12-foot spacing (SAFB 2001d and 2004d). The understory of this community includes broomsedge, primrose, wild plum, blackberry, and hawthorn. Examples of the animal species likely to occur within this community include the white-tailed deer, red fox, raccoon, opossum, striped skunk, cottontail, meadowlark, mockingbird, American kestrel, fence lizard, and black racer.

Oak/Hickory Forest - This community occurs only in the northern part of Shaw AFB adjacent to the housing areas. Native species within this community include white oak, pignut hickory, mockernut hickory, sparkleberry, flowering dogwood, winged elm, and loblolly pine. Examples of the animal species likely to occur within this community include the gray squirrel, southern flying squirrel, cottontail, American robin, and blue jay.

### 3.5.2 Wetland/Aquatic Communities

Wetland and aquatic communities occupy only a small area (slightly over 1%) of Shaw AFB (Figure 3-7). Although much more extensive wetland/aquatic communities occur on Poinsett ECR, none are present in the immediate vicinity of the administrative area where the proposed facility would be located. The wetland and aquatic community types identified on Shaw AFB are bottomland hardwood/small stream forest and ponds (SAFB 2001d).

Bottomland Hardwood/Small Stream Forest - True bottomland hardwood forest is not present within the perimeter of Shaw AFB, but this community does occur along the eastern base boundary within the floodplain of Long Branch. Long Branch crosses the northeast corner of the base within the runway approach. The community along the stream in this area and extending upstream to the confluence of Spann Branch and Long Branch in the northeast corner of the base has been described as Small Stream Forest.

Both Bottomland Hardwood and Small Stream Forest communities are similar in that they are periodically flooded, have similar soils, and have several of the same tree species. The Small Stream Forest south of this confluence and within the runway approach has been altered by past disturbance along Long Branch and the subsequent invasion of the floodplain by exotic plant species (SAFB 2001d). Within this area, Long Branch is surrounded by mainly hardwood forest consisting principally of river birch, red maple, sweetgum, and water oak.

As Long Branch flows south from the runway approach, it crosses the base boundary, parallels the boundary, and flows southeast to Booths Pond. In this area, the broad, swampy floodplain of Long Branch supports a Bottomland Hardwood Forest with a tall tree canopy and extensive areas of shallow, standing water and dense vegetation. The principal overstory trees in this forest include yellow poplar, sweetgum, red maple, tupelo, loblolly pine, water oak, and sycamore. The understory species include sweetbay, witchhazel, possumhaw viburnum, switchcane, greenbriar, blackberry, and cinnamon fern. Within this community, Long Branch is a meandering stream with a width of approximately 8-10 feet, a depth of 3-5 feet, and a significant flow.

One other area of Small Stream Forest on the base occurs in Mush Swamp, which originates in the southwestern corner of the base property on the south side of US 76/378. Mush Swamp retains a reasonably well-developed hardwood canopy of native tree species such as red maple, ash, laurel-leaf oak, and hackberry, as well as an understory that includes wax myrtle. However, its floodplain has also been extensively invaded by a number of exotics, such as the non-native shrubs Chinese privet and Japanese privet (SAFB 2001d).

Examples of the animal species likely to occur within this wetland community include the white-tailed deer, gray fox, muskrat, beaver, river otter, raccoon, opossum, wood duck, pileated woodpecker, kingfisher, lesser siren, amphiuma, and several species of minnow.

Pond – There are no natural ponds on Shaw AFB, but four artificial ponds have been built on the base, all within the heavily developed western area of the installation. Two of the ponds are on the golf course (No. 1 Hole Golf Course Pond and No. 8 Hole Golf Course Pond), one adjoins the golf course (Memorial Lake), and the smallest is southwest of the golf course behind the chapel (Chapel Pond). The ponds are managed for recreation (fishing and picnicking) and aesthetics. The pond margins are maintained in a largely open condition through regular mowing and trimming of taller vegetation. Emergent wetland vegetation within shallows and along the edges of the pond communities on the base includes nama, water-spider orchid, meadow beauty, bugleweed, ludwigia, downey lobelia, and smartweed. Examples of the animal species likely to occur within the pond communities include the mallard, Canada goose, kingfisher, largemouth bass, bullhead catfish, and various species of sunfish.

Memorial Lake is about 5.5 acres in size and is used extensively for fishing. The lake's banks generally have a small degree of slope, providing habitat for aquatic vegetation and

domesticated waterfowl. The pond has chronic aquatic weed and algae problems due to its design, golf course runoff, and the waterfowl population. Chapel Pond is approximately  $\frac{3}{4}$  acre in size and contains a small island. The No. 1 Hole Golf Course Pond is about 5.5 acres in size, and the No. 8 Hole Golf Course Pond is approximately 7.3 acres in size. It receives run-off from the golf course, provides irrigation water for the golf course, and is partially accessible for fishing. Poinsett ECR contains several small impoundments, including Week's Pond, and small, natural wetland ponds. However, these are not in the vicinity of the location proposed for the construction of an Administrative Facility within the existing administration area on the range (SAFB 2001d).

### 3.5.3 Endangered, Threatened, and Special Concern (ETSC) Species

Section 7 of the federal Endangered Species Act, as amended, requires each federal agency to ensure that "any action authorized, funded, or carried out by such agency ... is not likely to jeopardize the continued existence of any endangered species or threatened species or result in the destruction or adverse modification of habitat of such species ... unless such agency has been granted an exemption for such action..." In addition, animals designated by South Carolina as state endangered or threatened are granted legal protection by the state. The Heritage Trust Program of the South Carolina Department of Natural Resources maintains a database of reported occurrences of endangered and threatened species, and well as species considered to be of special concern by the state of South Carolina due to their declining populations in the state. This database can be searched online by county and by 7.5-minute South Carolina topographical quadrangle maps.

The South Carolina Heritage Trust Database was searched for records of ETSC species potentially occurring in Sumter County, which encompasses both Shaw AFB and Poinsett ECR. The species identified are those for which occurrences in the county have been reported. Accordingly, these species potentially could occur on or in the vicinity of Shaw AFB or Poinsett ECR if their required habitat is present. Table 3-3 identifies those federal and state listed ETSC species from the database for Sumter County, specifies their legal status, and includes a brief description of the typical habitat of each species.

In order to further evaluate the potential for any of the ETSC species in Sumter County to occur in areas potentially affected by the Proposed Action on Shaw AFB or Poinsett ECR, the Heritage Trust Database also was searched for the locations of ETSC species occurrences within the 7.5-minute quadrangles that encompass Shaw AFB and the northern portion of Poinsett ECR (where the administrative area is located). Inventories are periodically conducted on Shaw AFB and Poinsett ECR in an attempt to locate any ETSC plants and animals that potentially occur on these facilities (SAFB 2001d), and the results of these facility-specific surveys are reflected in the database records.

On Shaw AFB, the only ETSC species reported to occur is the least tern, which is state listed as threatened. Breeding least terns were observed nesting on the roof of the Base Exchange (BX) building on Shaw AFB during June 2001. Eight terns were observed in



the colony, and one young was produced and fledged. This is the farthest inland breeding record for the least tern in South Carolina. Least terns prefer to nest on coastal beaches in the state, but due to developmental pressures, they have been documented to nest on rooftops. This legally protected species is being monitored on the base and efforts are being made to minimize disturbance to the colony site (SAFB 2001d). The BX building is located in the middle of the developed western part of Shaw AFB, approximately 500 feet south of the No. 8 Hole Golf Course Pond and 1,000 feet west of the flight line.

**Table 3-3. South Carolina Endangered, Threatened, and Special Concern Species Inventory for Sumter County**

Scientific Name	Common Name	Legal Status	Special Concern Status *	Habitat
<b>Birds</b>				
<i>Haliaeetus leucocephalus</i>	Bald eagle	FT/SE	-	Edges of lakes and large rivers; seacoasts.
<i>Ictinia mississippiensis</i>	Mississippi kite	-	SC	Woodlands and brushy areas, near water.
<i>Picoides borealis</i>	Red-cockaded woodpecker	FE/SE	-	Open pine woods; pine savannas.
<i>Sterna antillarum</i>	Least tern	ST	-	Sandy beaches; sandbars.
<b>Mammals</b>				
<i>Corynorhinus rafinesquii</i>	Rafinesque's big-eared bat	SE	-	Pine and hardwood forest; caves; abandoned buildings
<i>Ursus americanus</i>	Black bear	-	SC	Large undeveloped wooded tracts.
<b>Reptile</b>				
<i>Micrurus fulvius</i>	Eastern coral snake	-	SC	Hardwood forest; pine flatwoods; marshes.
<b>Amphibian</b>				
<i>Acris crepitans crepitans</i>	Northern cricket frog	-	SC	Margins of shallow ponds or marshy areas.
<b>Plants</b>				
<i>Aristida condensate</i>	Piedmont three-awned grass	-	SC	Sandridges.
<i>Carex decomposita</i>	Cypress-knee sedge	-	SC	Swamps and lake margins on floating logs.
<i>Carya myristiciformis</i>	Nutmeg hickory	-	RC	Wet floodplain forests.
<i>Chamaedaphne calyculata</i>	Leatherleaf	-	SC	Wetlands and bogs.
<i>Cyperus lecontei</i>	Leconte flatsedge	-	SC	Sand dune swales; pond margins.
<i>Echinodorus parvulus</i>	Dwarf burhead	-	SC	Shallow pools and ponds.
<i>Echinodorus tenellus</i>	Dwarf burhead	-	SC	Shallow pools and ponds.
<i>Eleocharis robbinsii</i>	Robbins spikerush	-	SC	Pine savanna ponds.
<i>Eupatorium recurvans</i>	Coastal-plain thorough-wort	-	SC	Depressions.
<i>Lobelia boykinii</i>	Boykin's lobelia	-	SC	Cypress ponds; swamp margins.

Scientific Name	Common Name	Legal Status	Special Concern Status *	Habitat
<i>Nestronia umbellula</i>	Nestronia	-	SC	Oak-hickory-pine woods; often in transition areas between flatwoods and uplands.
<i>Oxypolis canbyi</i>	Canby's dropwort	FE	SE	Cypress ponds and sloughs; wet savannas.
<i>Plantago sparsiflora</i>	Pineland plantain	-	SC	Open, wet pine savannas; shallow ditches.
<i>Rhexia aristosa</i>	Awed meadowbeauty	-	SC	Pond margins and wet savannas.
<i>Rhexia cubensis</i>	West indian meadow-beauty	-	SC	Wet savannas including cutthroat seeps, flatwoods, and bogs.
<i>Rhynchospora scirpoides</i>	Long-beaked baldrush	-	SC	Floating mats in ponds; pond margins.
<i>Ruellia caroliniensis</i>	A petunia	-	SC	Woods and wood margins.
<i>Sagittaria isoetiformis</i>	Slender arrow-head	-	SC	Sandy ponds and bogs.
<i>Schwalbea americana</i>	Chaffseed	FE	SE	Ponds margins and wet savannas; land ridge forest.
<i>Scleria baldwinii</i>	Baldwin nutrush	-	SC	Wetlands.

*Notes:*

FE = Federal Endangered; RC = Of Concern, Regional (unofficial - plants only); SE = State Endangered (official state list - animals only); ST = State Threatened (official state list - animals only); SC = Of Concern, State.

\* The status designations in this column do not confer legal protection; these species are of special concern in the state because their populations may be declining.

- = no status designation

Source: South Carolina Heritage Trust (<http://www.dnr.state.sc.us/pls/heritage>). Website accessed

6/16/2004; data were last updated 6/9/2003; habitat descriptions obtained from a variety of sources.

On Poinsett ECR, fifteen ETSC species occurrences have been reported. However, none of these occurrences were located in the northern part of the range on or near the administrative area.

### 3.6 WATER RESOURCES

Water resources include surface waters and groundwater. Surface waters on Shaw AFB include ponds, streams, and other wetlands. Groundwater underlying the base is used as a source of drinking water.

## **Surface Waters**

The primary surface water resources on Shaw AFB include three streams, four artificial ponds, and canals and ditches created to collect storm-water runoff from runways and taxiways (SAFB 1999). The three naturally occurring streams at Shaw AFB are Long Branch, Spann Branch, and Mush Branch (Figure 3-7). Spann Branch crosses a short segment of base property at the northern boundary of the base and flows into Long Branch near the Palmetto Heights housing area. Long Branch eventually flows through the northeast corner of the Base, and then off-base to Booths Pond, Sawmill Pond, and Mush Swamp west of Sumter. The waters in the swamp eventually become part of the headwaters of the Pocotaligo Swamp and River south of Sumter (SAFB 2001d). The Pocotaligo River flows into the Black River, which empties into the Atlantic Ocean near Georgetown, South Carolina (SAFB 2001d). Mush Branch originates in the southern corner of the base property, south of US 76/378. It flows south from the highway across the base boundary and into Mush Swamp.

No. 1 Hole Golf Course Pond, No. 8 Hole Golf Course Pond, Memorial Lake, and Chapel Pond are centrally located within the developed area of the Base and are used primarily for recreational and aesthetic purposes (Figure 3- 7). No. 1 Hole Golf Course Pond is the northernmost pond and is approximately 5.5 acres in area. No. 8 Hole Golf Course Pond is located just south of No. 1 Hole Golf Course Pond and is approximately 7.3 acres in area. Memorial Lake is located south of the golf course ponds, its eastern shoreline is adjacent to Shaw Drive and west of Building 1130, and it is also approximately 5.5 acres in area. Chapel Pond is the smallest and southernmost of the ponds and is located behind the Palmetto Chapel (SAFB 2001d).

The dominant surface water features on Poinsett ECR are Carolina bays (SAFB 2001d). Carolina bays are shallow, poorly drained basins that may range in size from less than one acre to over one thousand acres. All unaltered bays on Poinsett ECR function as wetlands (SAFB 2001d). A named pond and stream also are located on Poinsett ECR. Weeks Pond is a man-made pond of approximately 7 acres located in the eastern portion of Big Bay, just west of Highway 120 in the southeastern part of the range (SAFB 2001d). Pine Tree Creek originates on Poinsett ECR and flows southeast off the range through Brunson Swamp and Sammy Swamp. In addition, numerous, small, isolated wetlands are present throughout the upland sandhills on Poinsett ECR, and ditches are present in the agricultural fields on the range (SAFB 2001d). None of these surface water features occur in the immediate vicinity of the Administrative Area of the range.

### **3.6.1 Surface Water Quality**

The water quality of the surface water resources within Shaw AFB and Poinsett ECR is potentially impacted by point and non-point sources of pollutants. Water bodies are classified by the state based on their water quality, and discharges that can affect water quality are regulated through permits.

### Water Quality Classifications

No waters classified as Outstanding Resources Waters (ORW) occur within one mile of Shaw AFB or Poinsett ECR (Kirkland 2004). The Pocotaligo River and its tributaries, including Long Branch, have been designated by South Carolina as Freshwaters, indicating that they are suitable for secondary contact recreation, drinking water supply after conventional treatment, fishing, and the survival and propagation of a balanced indigenous aquatic community of flora and fauna. South Carolina freshwaters are also considered suitable for agricultural or industrial uses (SCDNR 2004).

The state also classifies water bodies based on impairment. South Carolina's Section 303(d) List (SCDNR 2004) is a comprehensive public accounting of all impaired waterbodies in the state. No waterbodies on or in the immediate vicinity of Shaw AFB and Poinsett ECR are on the South Carolina Section 303(d) List. However, the Pocotaligo and Wateree Rivers, where surface waters from Shaw AFB and Poinsett ECR ultimately drain, are designated as biologically impaired water bodies regulated under the provisions of the CWA Section 303(d). They are both listed as impaired because of a fish advisory for mercury and aquatic life impairment due to low dissolved oxygen levels. Additionally, the Wateree River is listed as having a recreational use impairment due to fecal coliform contamination (SCDNR 2004).

### NPDES

Stormwater runoff from the base is regulated by the NPDES permit program administered by SCDHEC. Under the Base NPDES permit (No. SC0024970), there are six permitted outfalls through which wastewater and stormwater are discharged from the base. This permit became effective on April 23, 2003 and will expire on May 31, 2008. There are no permitted outfalls on Poinsett ECR (SAFB 1999).

The permit authorizes Shaw AFB to discharge to the following permitted outfalls and receiving waters. Outfall 001, which discharges treated wastewater from the WWTP, and Outfall 01A, which discharges treated groundwater from an air sparging unit, both discharge to Beech Creek, which drains west to the Wateree River. Outfalls 002 and 004 discharge stormwater to Long Branch, which drains to the Pocotaligo River. Outfalls 003 and 007 discharge stormwater to Mush Branch, which also drains to the Pocotaligo River. In addition to the six permitted outfalls above, two outfalls are no longer required to be permitted. Outfalls 005 and 006 collect stormwater from the east base and discharge to Long Branch and Booths Pond, respectively (SCDHEC 2001).

### Non-Point Source Discharge

Unlike pollution from industrial and sewage treatment sources, non-point source (NPS) pollution comes from many non-discrete sources. As rainfall runs off the land and man-made structures, natural and man-made pollutants are picked up, transported, and ultimately deposited into lakes, rivers, wetlands, coastal waters, and groundwater. These pollutants may have harmful effects on water quality, adversely affecting drinking water

supplies, recreation, wildlife, and fisheries. Potential NPS pollution at Shaw AFB originates from fertilizers, herbicides, and insecticides used in landscaped and developed areas; hydrocarbon and chemical runoff from parking lots, roadways, and the flight line; and sediment runoff from construction sites and land clearing.

### 3.6.2 Groundwater

There are three aquifer systems in the area of Shaw AFB including the Middendorf aquifer system, the Black Creek aquifer system, and the shallow aquifer system (SAFB 2001d). The Middendorf (Tuscaloosa) Aquifer is the deepest and most productive of the aquifer systems in the western portion of Sumter County. This aquifer is approximately 250 feet thick and is encountered at about 50 feet below mean sea level (MSL) at Shaw AFB. The Middendorf Aquifer is confined by a clay layer 15-to-75-feet-thick located at the base of the Black Creek Formation (SAFB 2001d).

The Black Creek aquifer system underlies most of Sumter County and is a significant water source for much of the central coastal plain (SAFB 2001d). The Black Creek Aquifer is separated into upper and lower portions by a confining layer. The upper aquifer is approximately 50 to 70 feet thick while the lower aquifer ranges from 75 to 105 feet thick. Wells completed in the Black Creek Aquifer are capable of yielding up to 750 gallons per minute (gpm). The six water supply wells currently operating at Shaw AFB are screened in the Black Creek Aquifer (Rust 1997).

The shallow aquifer system in the Shaw AFB area is made up of the Lang Syne Formation of the Black Mingo Group and the Duplin Formation. The Lang Syne Aquifer is located in the northwestern area of Shaw AFB, northwest of the Orangeburg Scarp. The Duplin Aquifer is present southeast of the scarp. The two aquifers are not hydraulically connected due to the presence of an aquitard, the fine-grained Sawdust Landing Formation, underneath the Lang Syne Aquifer (SAFB 2004d).

## 3.7 AIR QUALITY

Air quality is defined in a regulatory sense in terms of attainment status relative to national and state standards and other factors. The Clean Air Act, which was last amended in 1990, requires EPA to set primary and secondary National Ambient Air Quality Standards (NAAQS) for widespread pollutants considered harmful to public health and the environment. The EPA has set NAAQS for six principal pollutants, called "criteria" pollutants. They are ozone (O<sub>3</sub>), particulate matter less than 10 microns in diameter (PM<sub>10</sub>), carbon monoxide (CO), sulfur dioxide (SO<sub>2</sub>), nitrogen oxides (NO<sub>x</sub>), and lead (Pb).

Under the Clean Air Act, state and local agencies may establish ambient air quality standards and regulations of their own, provided these are at least as stringent as the federal requirements. The EPA has designated the Bureau of Air Quality of SCDHEC as the lead agency for enforcing federal laws and regulations dealing with air pollution in

South Carolina. Air quality rules in South Carolina are specified in South Carolina Regulation 61-62, *Air Pollution Control Regulations and Standards*.

### 3.7.1 Regional Air Quality

The EPA designates areas of the United States based on how they meet the NAAQS: *Nonattainment* – does not meet the national primary or secondary ambient air quality standard for the pollutant; *Attainment* – meets the standard for the pollutant; *Unclassifiable* – cannot be classified on the basis of available information as meeting or not meeting the standard. A *maintenance area* is a geographic region designated as “nonattainment” and subsequently re-designated to “attainment” subject to the requirements of a maintenance plan.

By federal law, each state has to develop a SIP that explains how they will implement the Clean Air Act requirements. The South Carolina SIP consists of South Carolina Regulation 61-62, specific attainment and maintenance plans for nonattainment areas in South Carolina, and supporting documentation.

Sumter County, which encompasses Shaw AFB, is designated as “attainment” for meeting the national and state ambient air quality standards for the criteria pollutants. No federally protected Prevention of Significant Deterioration (PSD) Class I area is located near Shaw AFB.

### 3.7.2 Air Emissions Sources

Shaw AFB holds a Title V Operating Permit (No. TV-2140-0004), which was issued by SCDHEC on April 30, 2001 and expires on November 30, 2005. The permit is intended to assure compliance with existing requirements applicable to regulated sources. Current air emissions at the base occur as a result of aircraft operations, including activities associated with aircraft refueling and maintenance. Mobile sources include aircraft, on-road vehicles, emergency generators, and aerospace ground equipment. Stationary sources include abrasive-based cleaners, surface coating operations, solvent-based cleaning machines, jet engine testing, fuel storage, fuel distribution, non-destructive inspection, and equipment leaks. Non-mission-related sources of air emissions at the base include boilers (external combustion), emergency generators (internal combustion), and woodworking.

The 2003 air emissions inventory for non-exempt stationary sources at Shaw AFB is summarized in Table 3-4. Table 3-5 shows the contributions to total emissions by source category.

## 3.8 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

The following section describes various hazardous materials and wastes that are used and generated at Shaw AFB. Areas potentially contaminated with hazardous wastes that are

part of the Air Force Environmental Restoration Program (ERP) are also discussed. Hazardous materials and wastes are regulated under RCRA.

In order to comply with federal and state regulations, Shaw AFB has implemented a Hazardous Waste Management Plan (HWMP). This plan is an internal guidance document that allows all hazardous materials and wastes on base to be managed, accumulated, transported, and disposed of in an environmentally sensitive manner (USAF 2003a). SCDHEC issued a permit (Permit No. SC7570024466) classifying Shaw AFB as a large quantity user and authorizing Shaw AFB to use, generate, and store hazardous materials and waste.

### 3.8.1 Hazardous Materials

Hazardous materials are any material that is not a waste, has been designated in the 49 CFR 172.101 Hazardous Materials Table, and has been determined by the United States Department of Transportation (DOT) to be capable of posing an unreasonable risk to health, safety, and property when transported in commerce. Activities at Shaw AFB that require the use and storage of hazardous materials are mainly associated with aviation and vehicle maintenance activities. These materials include but are not limited to fuels, batteries, antifreeze, paints, and solvents. Additional activities that may require the use and storage of hazardous materials include fire and weapons training activities. At Shaw AFB, lead-based paints, asbestos, and stored fuels are hazardous materials regulated under specialized management programs.

#### 3.8.1.1 Lead Based Paint and Asbestos

Many of the buildings at Shaw AFB were constructed during a time period when it was common to use asbestos-containing material (ACM) and lead-based paints (LBP) in the construction and maintenance of buildings. Asbestos is often found in pipe insulation, floor tiles and mastic, some wallboard, and ceiling tiles.

The Asbestos Management Plan (AMP) for Shaw AFB is designed to establish management and organizational responsibilities and procedures for ensuring that personnel in Air Force facilities are not exposed to excessive levels of airborne asbestos fibers. The plan's focus is on taking positive action to deal with current and near-term asbestos management needs, rather than on planning solely for future removal of ACM from base facilities. The AMP will provide the foundation for maintaining a permanent record on the current status and condition of ACM on Shaw AFB. The plan is reviewed each year and updated as necessary (USAF 2003b). A Lead-Based Paint Management Plan has also been developed to establish procedures for ongoing monitoring of intact lead-based paint surfaces and lead contaminated soil areas at Shaw AFB.

The Shaw AFB Abatement Team conducts surveys for ACM and LBP. A base-wide survey has not been performed, and surveys are conducted on an as-needed basis. Based on the age of the buildings on the base, it is assumed that ACM and LBP are present in many of the buildings. Asbestos is known to be present in the existing CATM Facility

(B1846), which is proposed for replacement as one of the projects (A51) included in the Proposed Action.

**Table 3-4. Summary of 2003 Total Emissions from Non-Exempt Stationary Sources**

Pollutant	2003 Emissions (pounds/year)
CO	37,350
NO <sub>x</sub>	87,889
SO <sub>2</sub>	10,856
PM-10	4,174
Pb	12
Total Volatile Organic Compounds (VOCs)	53,782
Total Hazardous Air Pollutants (HAPs) and Toxic Air Pollutants (TAPs)	3,261

Source: SAFB 2004e

**Table 3-5. Source Contributions to 2003 Total Emissions (pounds/year)**

Pollutant: Source	CO	NO <sub>x</sub>	SO <sub>2</sub>	PM-10	Pb	Total VOCs	Total HAPs and TAPs
Above-ground storage tanks (ASTs)	--	--	--	--	--	893	129
Abrasive cleaners	--	--	--	3	--	--	--
Degreasers	--	--	--	--	--	383	7
Emergency generators	930	4,258	304	286	--	333	6
Equipment leaks	--	--	--	--	--	--	21
External combustion	10,450	14,027	719	1,019	> 1	686	227
Fuel dispensing	--	--	--	--	--	42,266	1,174
Incinerators	23	7	6	11	--	7	--
Jet engine testing	25,947	69,597	9,827	2,098	12	3,197	999
Loading racks	--	--	--	--	--	1,118	44
Paper shredder	--	--	--	> 1	--	--	--
Surface coating	--	--	--	270	--	1,292	598
USTs	--	--	--	--	--	3,607	56
WWTP	--	--	--	483	--	--	--
Woodworking	--	--	--	4	--	--	--
Total	37,350	87,889	10,856	4,174	12	53,782	3,261

Source: SAFB 2004e



### 3.8.1.2 Above Ground and Underground Storage Tanks

USTs are regulated through the SCDHEC UST Program. A 1996 basewide survey identified 154 USTs that were either in use, removed, or abandoned in place. Of these, 34 USTs are in use at Shaw AFB. Contents of the tanks include gasoline, No. 2 fuel oil, diesel fuel, and JP-8 jet fuel (USAF 2003a).

The survey also identified 175 above-ground storage tanks (ASTs). AST contents include diesel fuel, gasoline, JP-8, 1010 oil, No. 2 fuel oil, and used oil (USAF 2003a).

### 3.8.2 Hazardous Waste

Hazardous waste is defined under RCRA as any solid, liquid, contained gaseous, or semisolid waste, or any combination of wastes that could pose a substantial hazard to human health or the environment. Waste may be classified as hazardous because of its toxicity, reactivity, ignitability, or corrosivity. Certain types of wastes are “listed” or identified as hazardous in 40 CFR 263 (USAF 2003a).

Hazardous wastes generated on Shaw AFB are typically associated with operations and maintenance of the aircraft and vehicles. They include solvents, spent acids, and sludge from wash racks. There are currently 40 initial accumulation points for hazardous waste generated on the installation. There are eight 90-day hazardous waste accumulation points on Shaw AFB where hazardous waste may be accumulated in tanks and/or containers for up to 90 days (USAF 2003a). A large amount of waste is recycled at the base, including all lubricating fluids, batteries, oil filters, and shop rags. During the first 3 quarters of FY 2003, Shaw AFB generated 38,234 pounds of regulated hazardous waste.

Shaw AFB operates one hazardous waste management facility that requires a permit under state and federal regulations (Permit No. SC7570024466). The facility is a hazardous waste treatment, storage, and disposal (TSD) facility that is operated by the DRMO. The RCRA TSD permit was first issued by SCDHEC in October 1992 and allows for the storage of 7,026 gallons of hazardous waste (USAF 2003a).

The Poinsett ECR also operates as a small quantity generator of hazardous waste (Permit No. SC9570090002). Hazardous waste generated at the facility is from the operation of an electronic combat radar site. Typical wastes are batteries, fuels, and fluorescent light bulbs (USAF 2003a).

The Thermal Treatment Unit (TTU) at Poinsett ECR has officially been closed, and all munitions are now returned to the Designated Disposition Authority at Hill AFB for processing (Behr 2004a).

### 3.8.3 Environmental Restoration Programs

Shaw AFB has been an active Air Force base for approximately 63 years. Past and current activities include maintenance of aircraft and vehicles, facility upkeep, and fuel/oil storage. As a result of these activities, some areas on the base have become contaminated with hazardous or toxic substances (e.g., petroleum products such as JP-4 jet fuel, waste oils, solvents, and pesticides). Depending on the cause and type of contamination, sites may be regulated under three different state or federal regulatory programs: CERCLA, RCRA, and the South Carolina UST Program. Sites at Shaw AFB that are potentially contaminated with hazardous or toxic substances are regulated under the RCRA and South Carolina UST programs. There are no CERCLA (Superfund) sites at Shaw AFB.

The DoD developed the ERP to identify, investigate, and remediate potential hazardous waste sites that existed on DoD properties prior to 1984. The *Shaw AFB Environmental Restoration Program Management Action Plan* (USAF 2003c) summarizes the current status of the base environmental programs and ERP sites, and it presents a comprehensive strategy for implementing actions necessary to protect human health and the environment. This strategy integrates activities under the ERP and the associated environmental compliance programs that support full restoration of the base. ACC policy requires that any project on or near an ERP site be coordinated through the Shaw ERP Manager.

There are 34 ERP sites and two Areas of Concern on Shaw AFB. Fourteen of the ERP sites have been administratively closed, and an additional eight sites are pending closure. These sites include landfills, sludge disposal, fire training areas, fuel spills, fuel leaks from tanks and pipelines, drainage areas, oil/water separators, and other disposal areas. ERP sites located near projects included in the Proposed Action are shown in Figure 3-8.

## 3.9 SAFETY

The subject of safety encompasses many issues that directly affect the protection of human life and property. The predominant safety issues relevant to the Proposed Action at Shaw AFB involve general operations and construction, munitions, aviation, and force protection.

### 3.9.1 General Operational Safety

Day-to-day operations at Shaw AFB are conducted in accordance with applicable Air Force safety regulations, Air Force technical orders, and standards prescribed by Air Force Occupational Safety and Health (AFOSH) requirements. These regulations prescribe measures, processes, and procedures to ensure safe operations and to protect the public, military, and property. These regulations govern all aspects of daily activity at the installation, and their applicability ranges from standard industrial and construction safety requirements (e.g., wearing of hard hats and safety clothing) to complex procedures concerning aircraft operations and maintenance of munitions.

### 3.9.2 Munitions Safety

Shaw AFB and other installations with munitions or explosives storage, handling, and maintenance facilities are required to establish safety clearance zones around these facilities. Air Force Manual (AFM) 91-201, *Explosives Safety Standards* (USAF 2000), requires that defined distances be maintained between explosives storage and handling areas and a variety of other types of facilities. These distances define quantity-distance (Q-D) zones. Each munitions storage or handling facility has a Q-D zone extending from the sides and corners of the building outward for a prescribed distance, resulting in a series of arcs that define the perimeter of the Q-D zone. The size of a Q-D zone depends on several factors, including the type and quantity of explosives contained in the facility. The quantity is based on the net explosive weight of the munitions, i.e., the weight of the actual explosives in the munitions not including the weight of the steel casing or other non-explosive components. In addition, munitions storage facilities must be located in areas where their security can be ensured.

Air Force safety regulations define many factors that affect Q-D requirements. One of these factors that may be a significant constraint to adjacent development is the allowable distance to an inhabited building (IB). The IB distance is also required to be maintained between explosive storage and handling locations and base boundaries, roadways, or the perimeter of any existing “local restrictive easement estate” or agreement (USAF 1994). The IB distance does not apply if the base or restrictive easement boundary is located adjacent to land that is open and unsuitable for habitation or public gatherings.

Property within Q-D zones must be owned, leased, or controlled by the base or its tenants, or an easement must be acquired that restricts use of the property to those uses compatible with the safety requirements of AFM 91-201. The existing Q-D zones on Shaw AFB are associated with munitions storage areas on the east side of the base, the central portion of the airfield, and the flight line area (Figure 3-9).

### 3.9.3 Aviation Safety

The DoD developed the AICUZ program for military airfields in order to protect aircraft operational capabilities while assisting local governments in protecting and promoting the health and safety of the public. AICUZ reports describe three basic types of constraints that affect or result from flight operations: noise zones (described in Section 3.10), accident potential zones, and airfield clearance requirements (i.e., height limitations on structures in the vicinity of airfields) (USAF 1994).

#### 3.9.3.1 Accident Potential Zones

Accident potential zones are based on statistical analysis of past DoD aircraft accidents. DoD analysis has determined that the areas immediately beyond the ends of the runways and along the approach and departure flight paths have significant potential for aircraft accidents. Based on this analysis, DoD developed three zones that have high relative potential for accidents. The Clear Zone, the area closest to the end of the runway, is the

most hazardous. The overall risk is so high that DoD generally acquires the land through purchase or easement to prevent development. Shaw AFB has acquired all land in the Clear Zones. The Clear Zones at Shaw AFB extend 3,000 feet from the ends of each of the two runways and 1,500 feet on each side of the center line of each runway, resulting in partially overlapping 3,000-by-3,000-foot zones at each end of the airfield (USAF 1994). The Clear Zones are mapped in Figure 3-9.

APZ I is an area beyond the Clear Zone that has a significant potential for accidents; it extends 5,000 feet from the end of the Clear Zone. APZ II is an area beyond APZ I that has a measurable potential for accidents; it extends 7,000 feet from the end of APZ I. While aircraft accident potential in APZs I and II does not warrant acquisition of these areas by the Air Force, land use planning and controls are strongly encouraged in these areas for the protection of the public (USAF 1994).

#### 3.9.3.2 Airfield Clearance Requirements

Air Force regulations define areas on and around airfields that are to remain clear of obstructions. Hazards are identified in these areas, and development is restricted to promote aviation safety, minimize danger to people and facilities, and prevent hindrances to flight operations. Imaginary surfaces (planes and conical surfaces) extending above and away from the airfield have been identified to define the spaces within which aircraft operate. Criteria have been established to govern the location and height of structures in the vicinity of these surfaces. Height and obstructions criteria have been established at Shaw AFB and include clearance requirements specifying height limitations on structures in the vicinity of the airfield (USAF 1994).

Obstacles that penetrate the imaginary surfaces are identified and evaluated for their impact on safety. Violations may involve either obstacles that are manmade (e.g., power lines) or natural (e.g., trees). Obstacles that are allowed to remain are included in one of three categories: permanent waivers, permissible deviations, or exemptions (usually based on the date of construction). Obstacles classified as deviations or exemptions do not require a waiver. Approximately 147 obstacles at Shaw AFB currently have permanent waivers, deviations, or exemptions (SAFB 1999). The base has an ongoing Airfield Obstruction Reduction Initiative Program to remove airfield obstructions from the runway environment and correct zone violations (SAFB 2004c).

#### 3.9.4 Force Protection

Force protection is a security program designed to protect Air Force personnel, civilian employees, family members, facilities, and equipment, in all locations and situations. The program is accomplished through the planned and integrated application of antiterrorism measures, physical security, operations security, and personal protective services. It is supported by intelligence, counterintelligence, and other security programs. In response to terrorist attacks and the need to improve force protection, the DoD in the late 1990s required the development of AT/FP guidelines for new construction. That requirement was partially implemented in 1999 when the DoD promulgated AT/FP

Construction Standards (DoD 1999) to ensure that force protection standards are incorporated into the planning, programming, and budgeting for the design and construction of Military Construction (MILCON) funded facilities. These standards are integrated at Shaw AFB into the new construction and major renovation projects to which they apply.

Force protection at Shaw AFB also is maintained through the use of entry gates to control access to the base. Vehicles enter and exit the base through five security checkpoints: the Main Gate on Shaw Drive, the Polifka Street Gate, the Frierson Street Gate, the Sycamore Street Gate at the Palmetto Heights residential area, and the North Gate on Frierson Road (Byer 2004a). Current gate facilities are inadequate in several respects. The Main Gate on Shaw Drive is located adjacent to an off-base wooded area to the west and does not provide adequate space for search and inspection of suspect vehicles. The current location of the Main Gate also causes traffic to back up onto US 76/378, increasing the potential for vehicle accidents. The gatehouse at the entrance to the Palmetto Heights housing area is a temporary facility installed after 9/11/01 and does not meet the requirements of security forces personnel. In addition, lighting at all gates controlling access to the base is poor and hinders the deterrence of possible attacks.

### 3.10 NOISE

Noise is defined as unwanted sound that either prevents or interferes with daily human activities. The response of individuals to noise varies depending on the type of noise, the duration of the noise, the time of day, the location, and the type of activity underway that is being interrupted. The primary source of noise at Shaw AFB is aircraft operations. Table 3-6 relates decibel (dB) values to sounds commonly heard in our environment. The dB values presented in Table 3-6, and throughout this EA, are A-weighted levels. An A-weighted sound level of a noise represents the approximate frequency response characteristic of the average young human ear. The A-weighted sound level has been used extensively in this country for the measurement of community and transportation noises.

The AICUZ program has been developed in an effort to protect local citizens from the noise exposure and accident potential associated with flying activities and to prevent degradation of the Air Force's capability to achieve its mission by promoting compatible land use planning. The most recent AICUZ Study for Shaw AFB was published in 1994 (USAF 1994). This study provides noise contours associated with aircraft operations and promotes compatible land development in areas subject to aircraft noise. Because the same level of noise is more intrusive at night than it would be during the day, the Air Force uses the Day-Night Average Sound Level (Ldn or DNL) to describe noise. The Ldn averages the sound energy from aircraft operations over a 24-hour period and assigns an additional 10-dB penalty to noises that occur between 10:00 pm and 7:00 am. The noise contours mapped as part of the 1994 AICUZ Study for Shaw AFB were updated by ACC in February 2004. These current noise contours are shown in Figure 3-10. About 85 percent of the area within the installation boundary is within noise level zones that exceed the Ldn of 65 dB (the level of concern for residential land use).

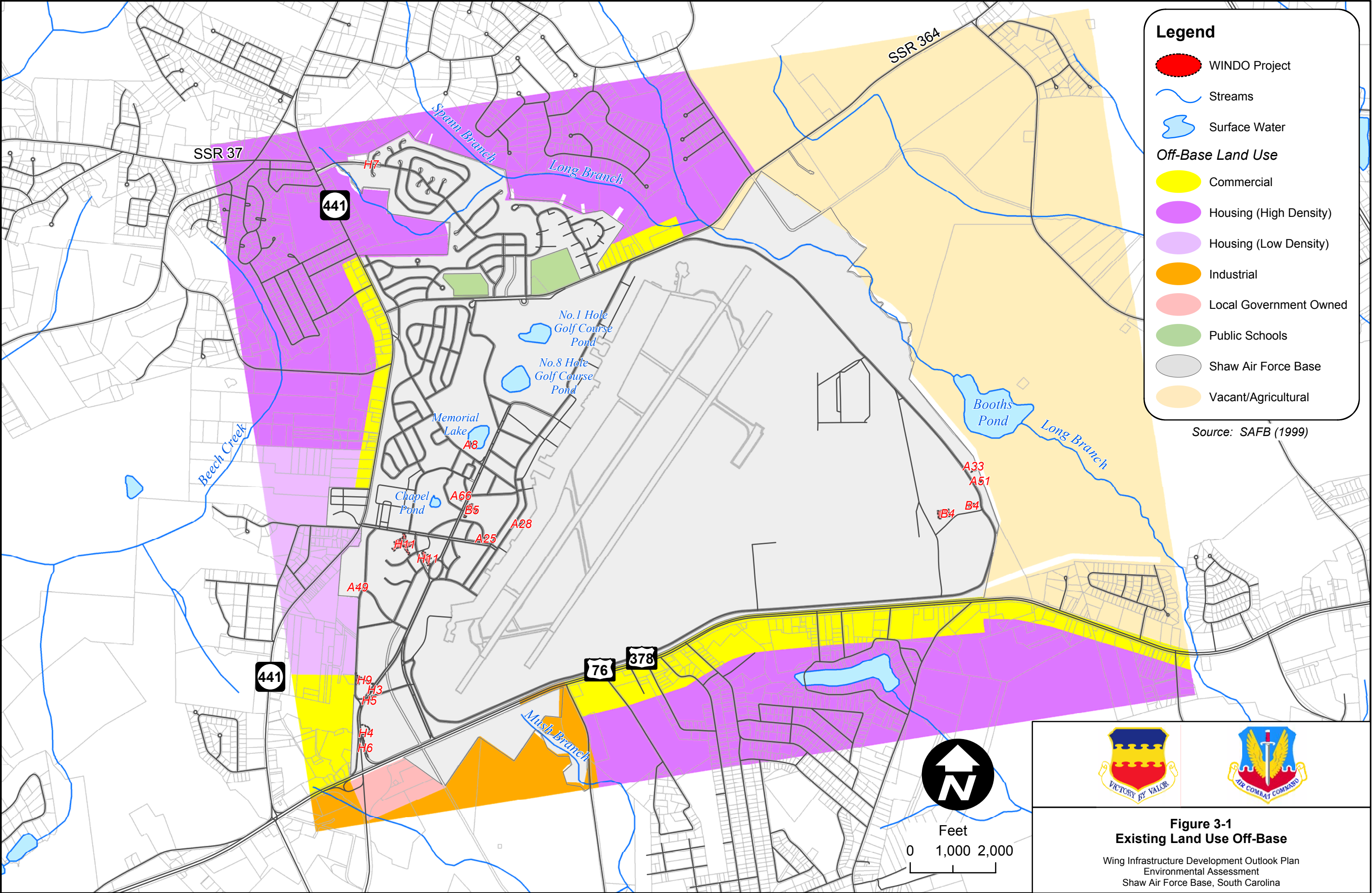
The AICUZ Study (USAF 1994) defines compatible and non-compatible land uses adjacent to Shaw AFB. Generally, residential uses are considered incompatible within Ldn 75 dB. Below Ldn 65 dB, there are usually no restrictions on residential land uses due to noise. Areas between Ldn 65 dB and 75 dB may not qualify for federal mortgage insurance according to Department of Housing and Urban Development (HUD) Regulations (24 CFR 51B). Moreover, residences may require additional noise attenuation measures be incorporated into their construction.

**Table 3-6. Typical Decibel Levels of Familiar Sounds**

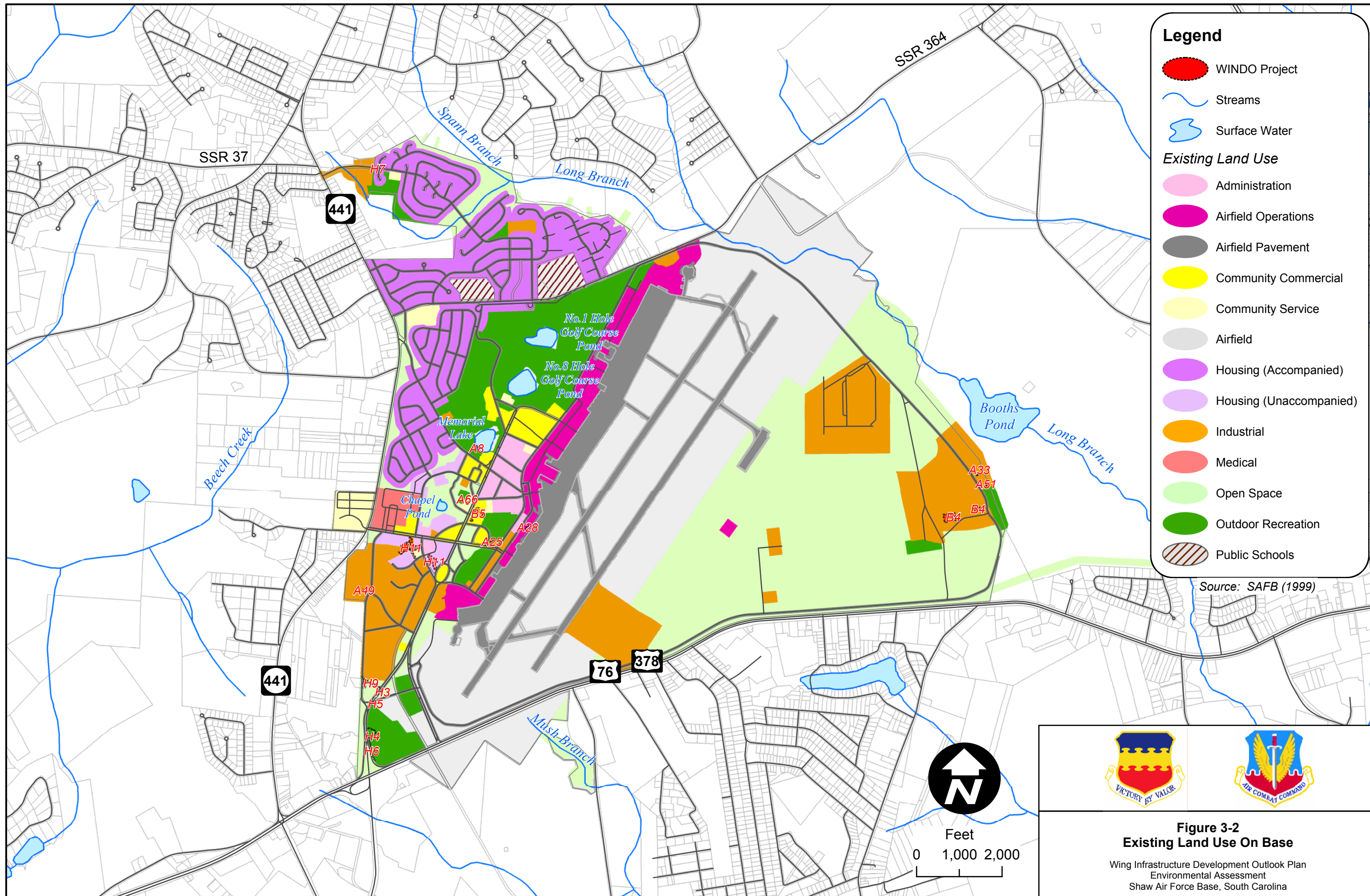
dB	Sound
140	Airplane taking off
130	Power drill
120	Jet plane at ramp
110	Leaf blower, Motorcycle
100	Loud Rock band
90	Lawn mower, Truck (50 feet)
80	City traffic, Vacuum cleaner (5 feet)
70	Freeway traffic, Freight train (100 feet)
60	Normal conversation
50	Light traffic (100 feet), Large office
40	Quiet residential area
30	Soft whisper
20	Whispering (5 feet)
10	Normal breathing
0	Faintest audible sound

Industrial and manufacturing uses are generally considered compatible with higher noise levels. Noise attenuation measures are recommended for portions of buildings committed to activities that need lower levels, such as scientific research, office space, and public reception areas. Commercial and business uses are compatible without attenuation to Ldn 70 dB and are considered incompatible at Ldn 80 dB and up. Between Ldn 70 dB and Ldn 80 dB, noise attenuation measures should be included in the design and construction of buildings. Public and quasi-public services require a quieter environment. These types of uses should be located outside the Ldn 65 dB contour or else provide adequate noise level reduction (USAF 1994).

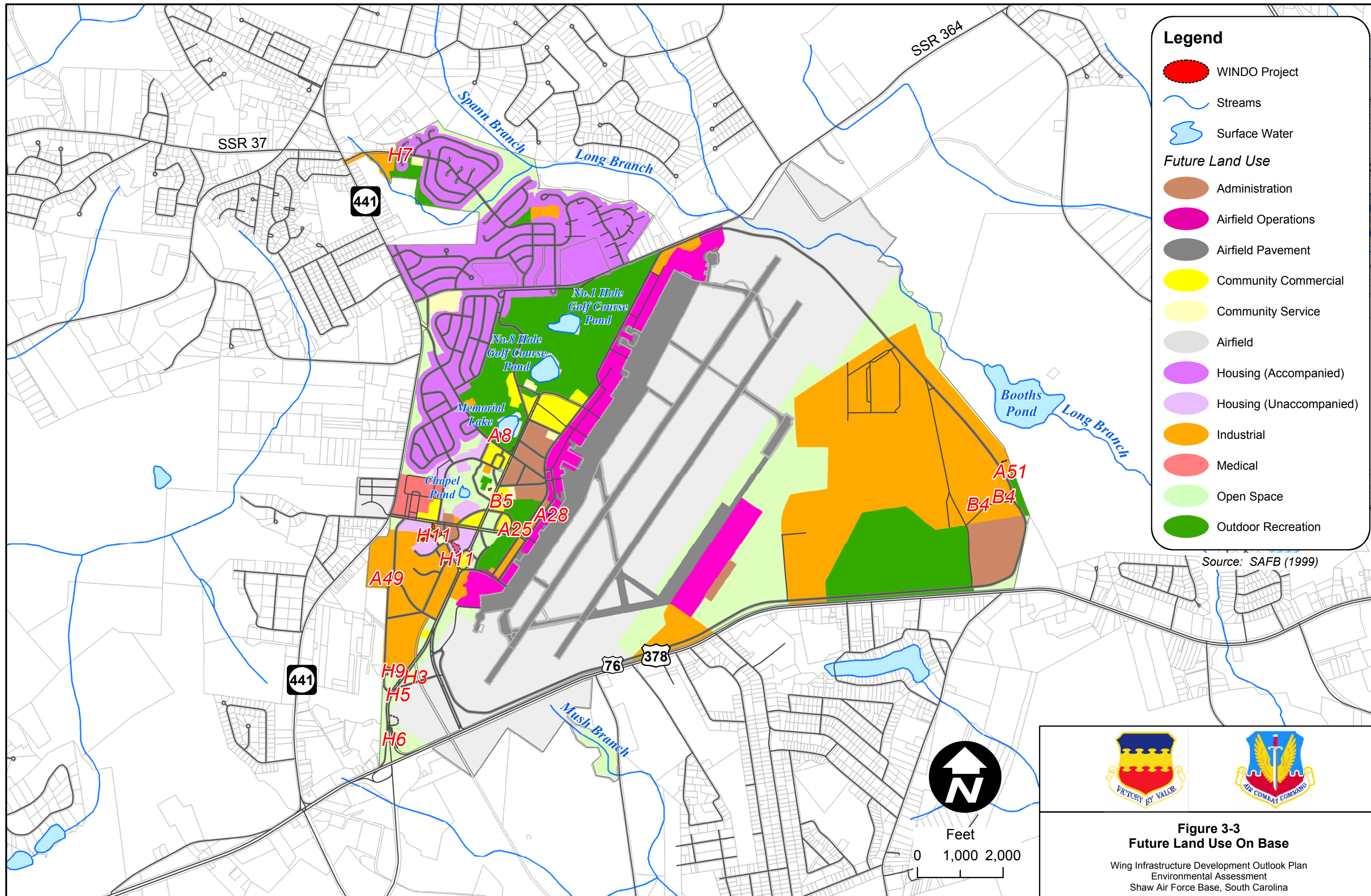




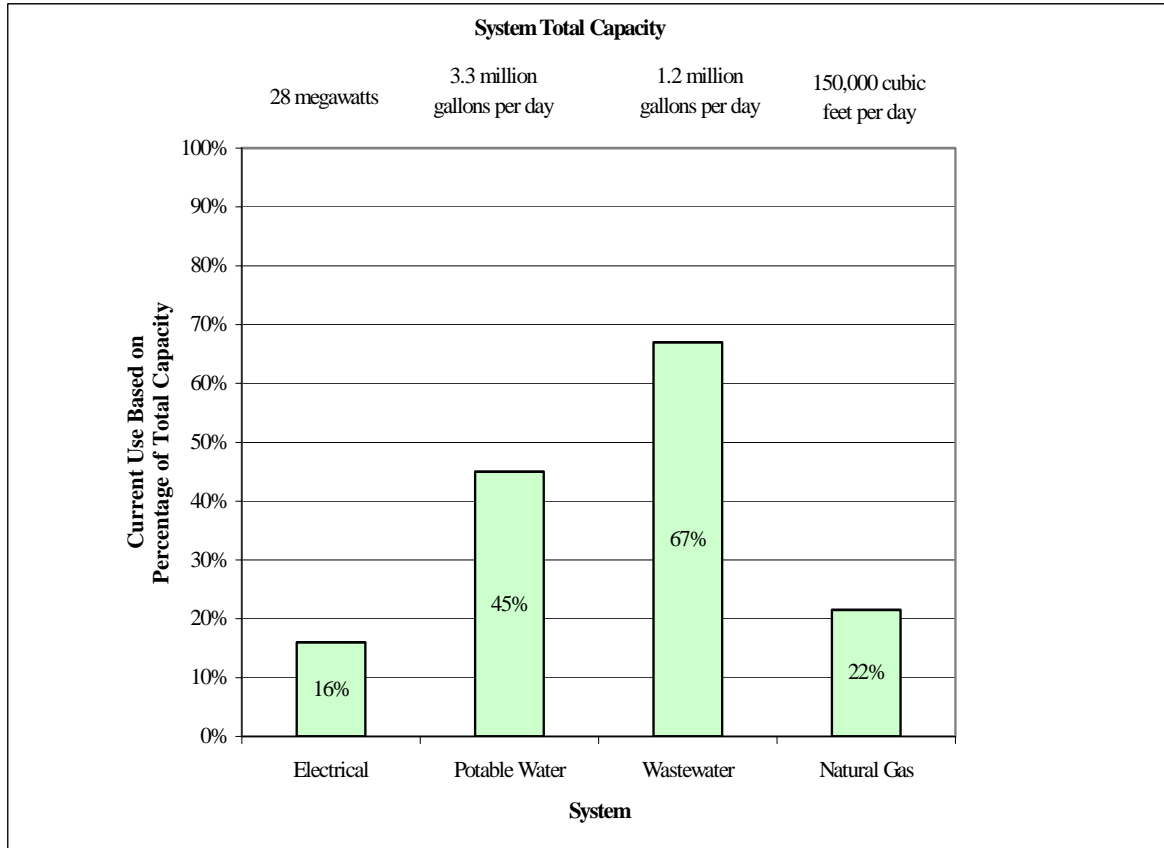




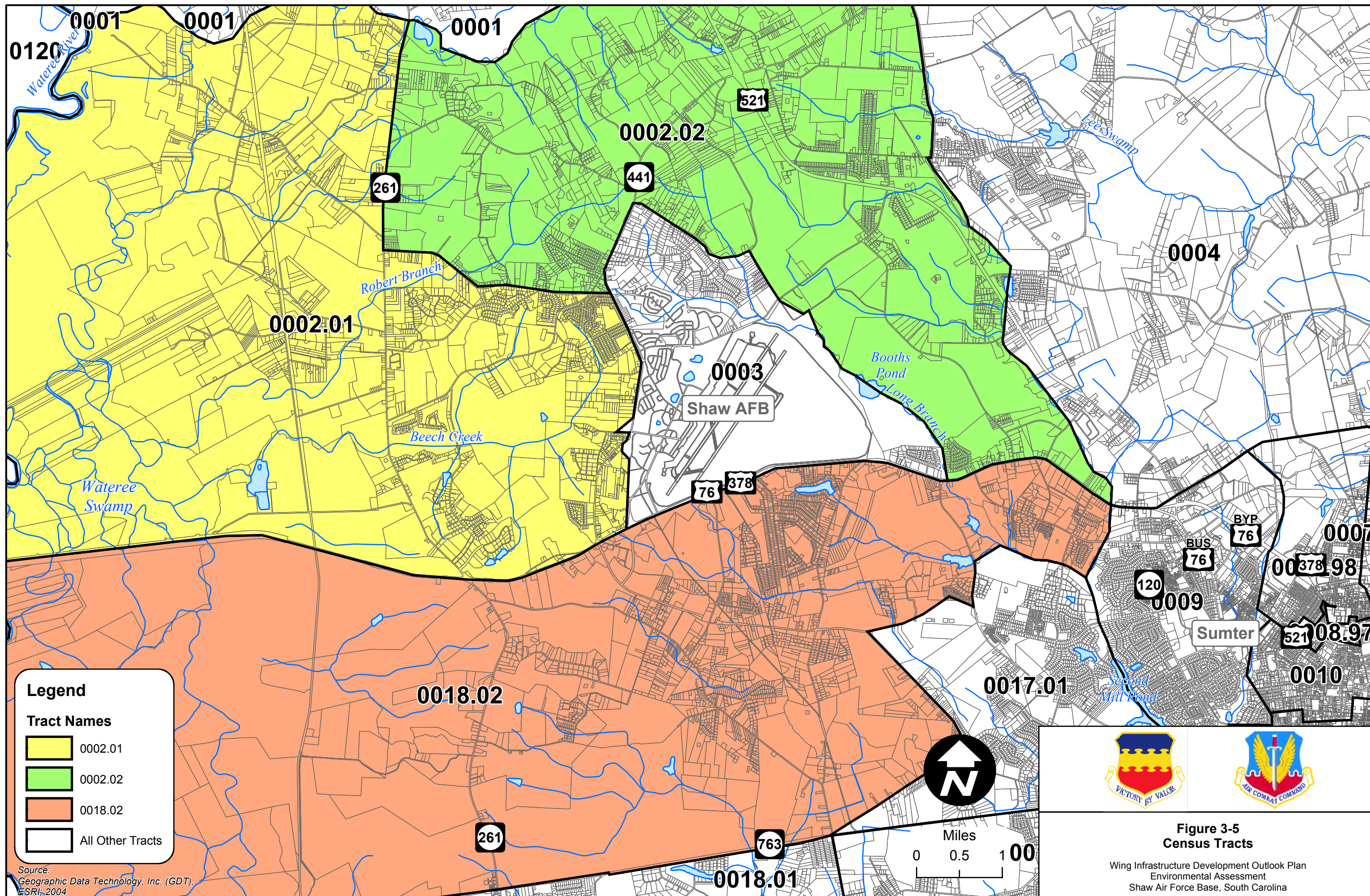




**Figure 3-4**  
**Infrastructure System Capacities**  
**Wing Infrastructure Development Outlook Plan**  
**Environmental Assessment**  
**Shaw Air Force Base, South Carolina**







**Legend**

**Tract Names**

Yellow	0002.01
Green	0002.02
Orange	0018.02
White	All Other Tracts

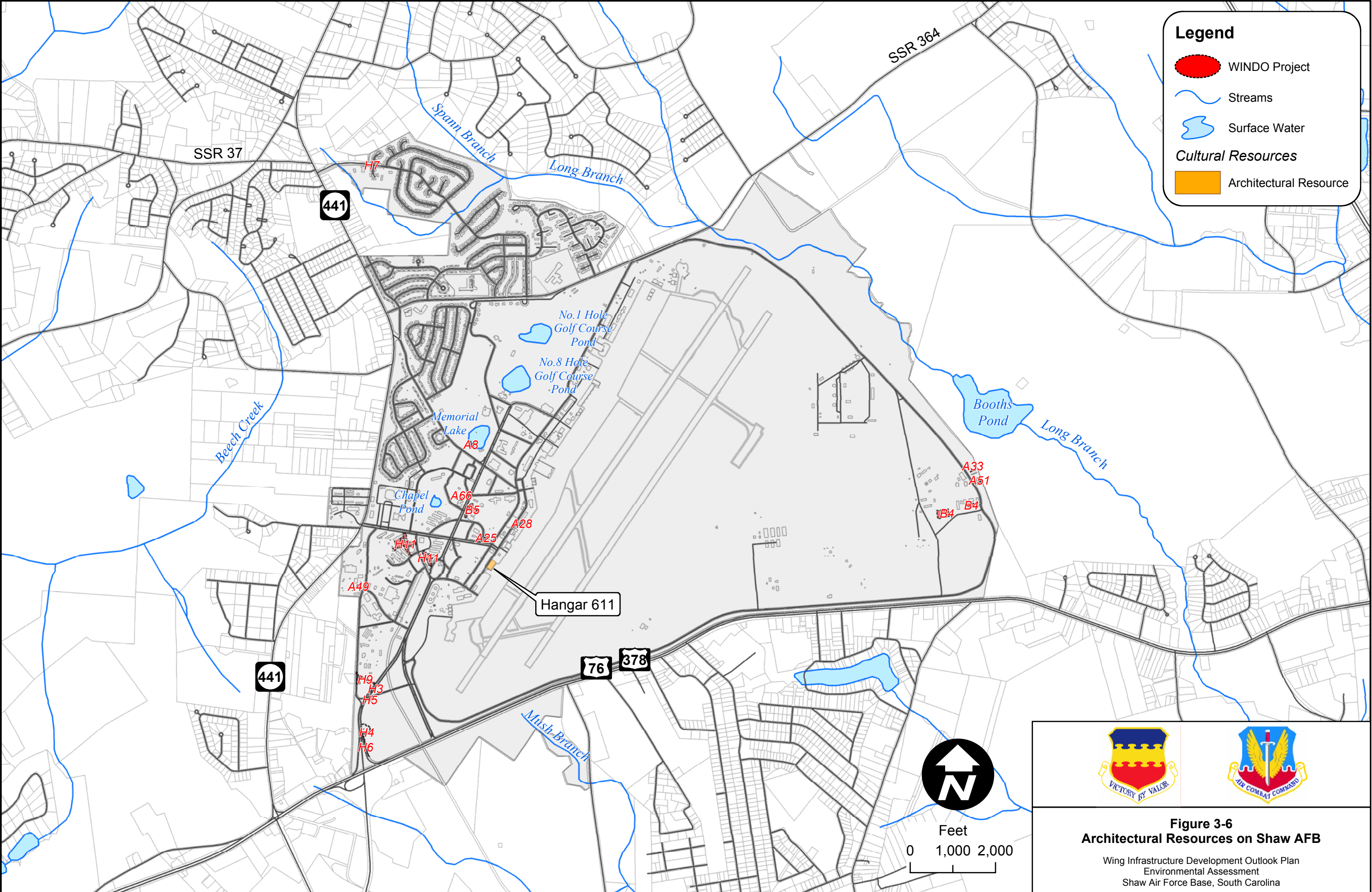
Source:  
Geographic Data Technology, Inc. (GDT),  
ESRI, 2004





**Figure 3-5  
Census Tracts**

Wing Infrastructure Development Outlook Plan  
Environmental Assessment  
Shaw Air Force Base, South Carolina



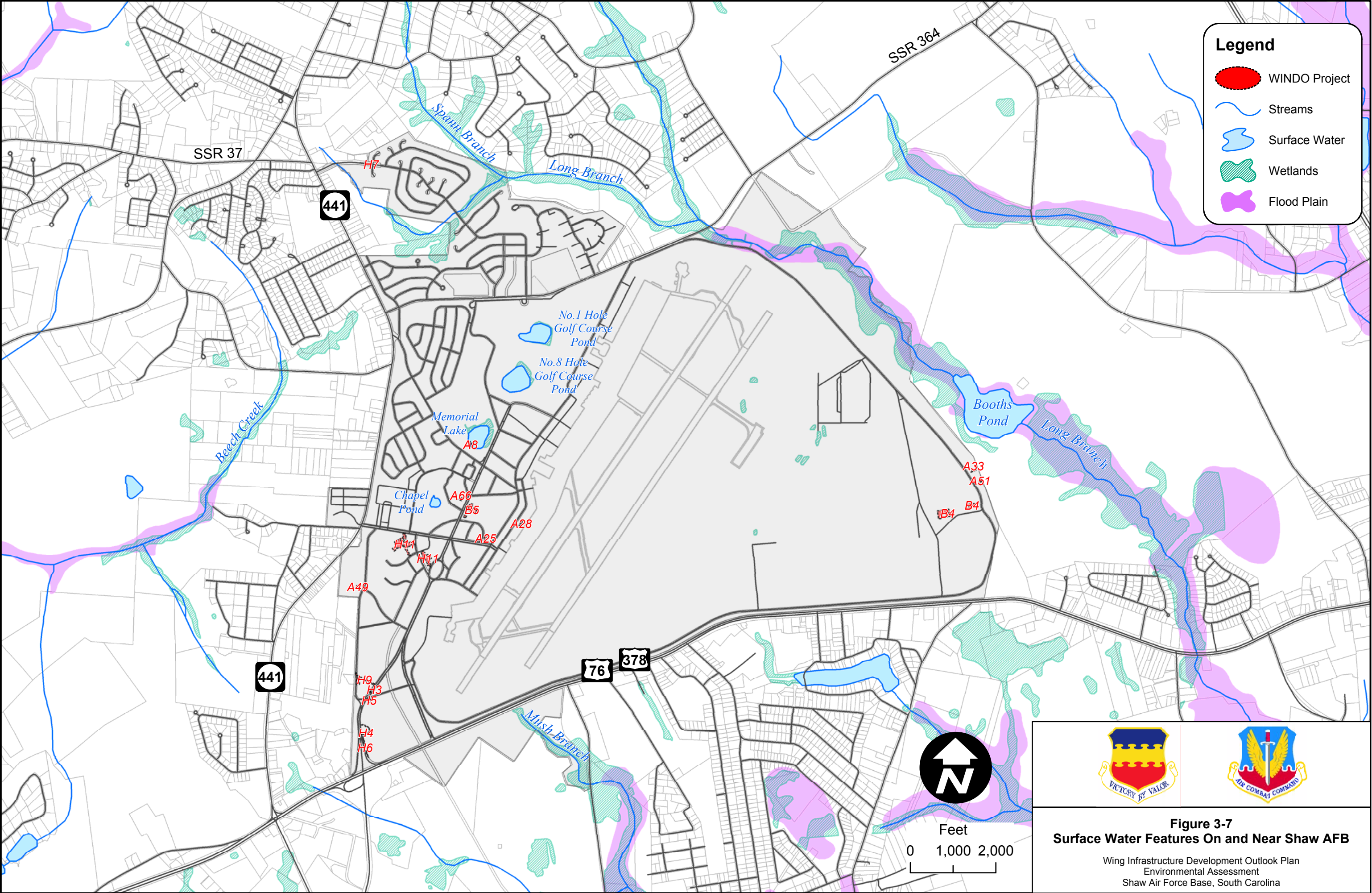




**Figure 3-6**  
**Architectural Resources on Shaw AFB**

Wing Infrastructure Development Outlook Plan  
Environmental Assessment  
Shaw Air Force Base, South Carolina

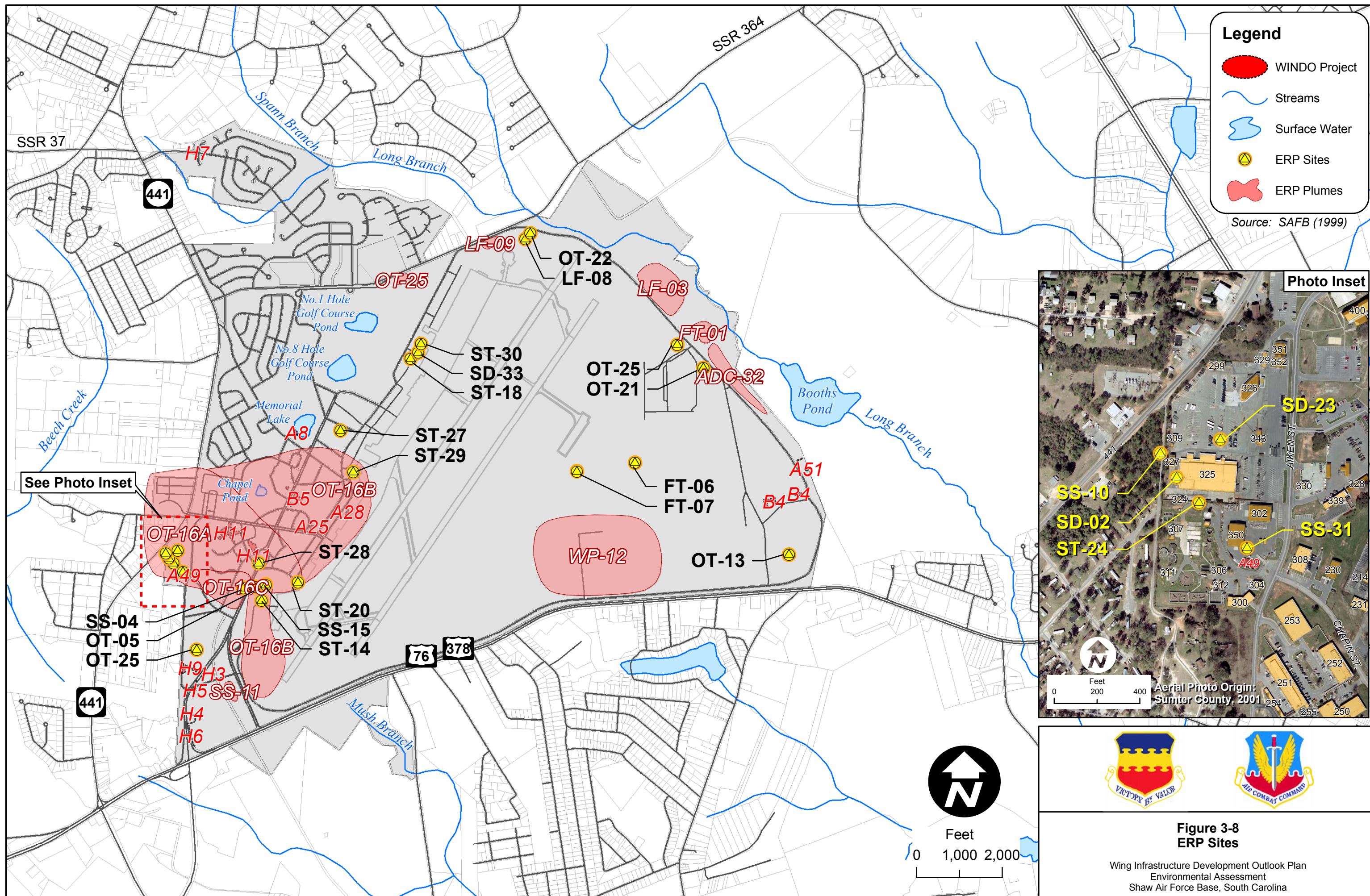




**Figure 3-7**  
**Surface Water Features On and Near Shaw AFB**

Wing Infrastructure Development Outlook Plan  
Environmental Assessment  
Shaw Air Force Base, South Carolina

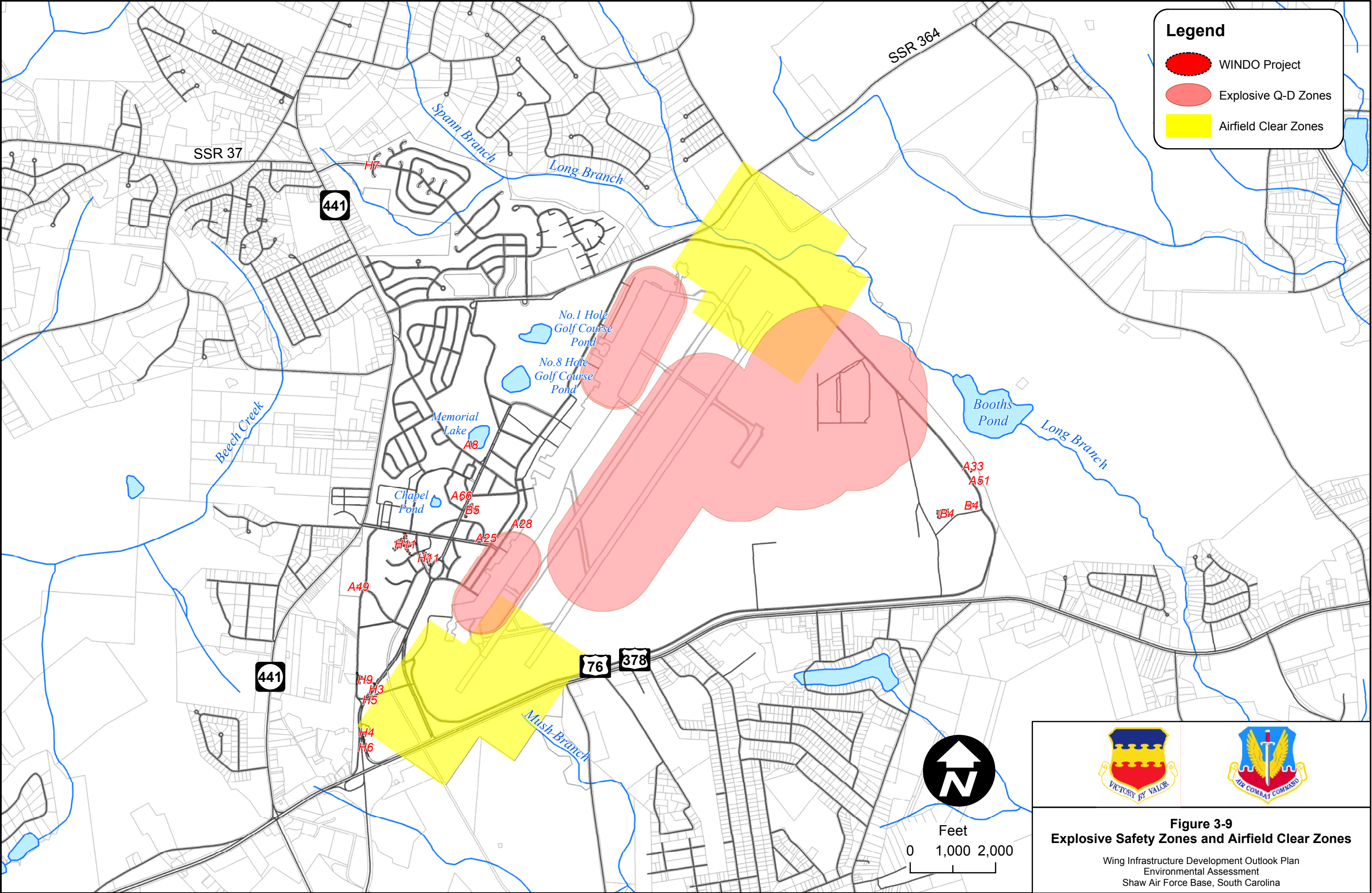




**Figure 3-8**  
**ERP Sites**

Wing Infrastructure Development Outlook Plan  
Environmental Assessment  
Shaw Air Force Base, South Carolina

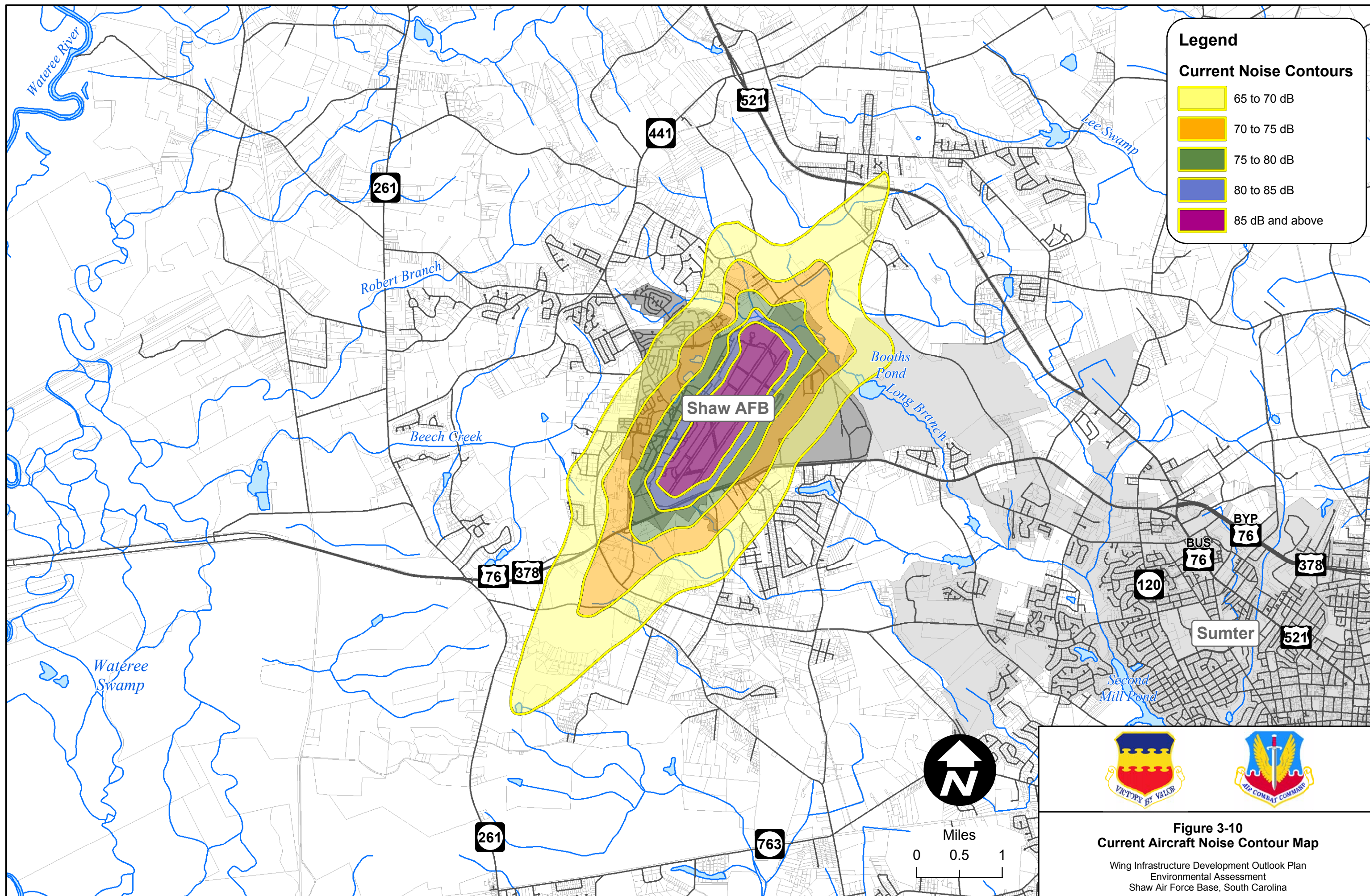




**Figure 3-9**  
**Explosive Safety Zones and Airfield Clear Zones**

Wing Infrastructure Development Outlook Plan  
Environmental Assessment  
Shaw Air Force Base, South Carolina





**Figure 3-10**  
**Current Aircraft Noise Contour Map**

Wing Infrastructure Development Outlook Plan  
Environmental Assessment  
Shaw Air Force Base, South Carolina

## 4.0 ENVIRONMENTAL CONSEQUENCES

This chapter describes the environmental consequences from implementation of the No-Action Alternative and the Proposed Action, respectively. The consequences are discussed on the basis of the environmental resources described in Chapter 3, and in the same order. Within each section, the consequences of the No-Action Alternative are discussed first in order to provide a description of impacts currently occurring under existing, baseline conditions. The consequences of the Proposed Action then are described and compared to the consequences under the No-Action Alternative in order to determine the relative magnitude and significance of impacts under the Proposed Action. The CEQ Regulations implementing NEPA require evaluation of the significance of an impact based on both its context and intensity. The evaluation of the significance of an impact involves consideration of several contexts, including the consideration of local and regional effects and short-term and long-term effects. The significance of an impact also is evaluated with regard to its intensity or severity. The regulations provide ten considerations relevant to assessing the significance of impacts (40 CFR 1508.27):

- 1) Is the impact adverse or beneficial?
- 2) Does the impact affect public health or safety?
- 3) Does the area affected have unique characteristics such as historic or cultural sites, farmlands, parklands, wetlands, wild and scenic rivers, or ecologically critical areas?
- 4) Is the impact highly controversial?
- 5) Is the impact highly uncertain or unknown?
- 6) Does the effect of the action establish a precedent for future actions with significant effects?
- 7) Is the impact related to other impacts that are individually insignificant but cumulatively significant?
- 8) Does the impact adversely affect scientific, cultural, or historical resources?
- 9) Does the impact adversely affect an endangered or threatened species or its habitat?
- 10) Does the impact threaten a violation of federal, state, or local laws or regulations for the protection of the environment?

In the following sections, the level of impact of each alternative on each environmental resource is estimated, and those impacts determined to have more than a minor adverse effect are further evaluated with regard to their significance based on context and intensity. The evaluation includes consideration of mitigation measures, if relevant, so that the final assessment of impact is based on the remaining effects after mitigative factors have been taken into consideration. In addition, the possibility of significant impacts from cumulative effects that are not individually significant also is considered. Chapter 5 further addresses possible cumulative impacts from the Proposed Action in conjunction with other actions.

### 4.1 LAND USE RESOURCES

#### 4.1.1 No-Action Alternative

Under the No-Action Alternative, land uses on Shaw AFB would remain essentially the same as under existing conditions. Consequently, implementation of the No-Action Alternative would have no significant adverse impact on land use. Traffic flow onto the

base would continue to be delayed under the No-Action Alternative, as currently there are inadequate vehicle inspection areas, lighting, and barriers at the main entrance gate. Therefore, the No-Action Alternative would have a minor adverse effect on transportation, and the impact would not be significant. The temporary gatehouse at Palmetto Heights and the chain link fence at the location of the new Main Gate would continue to detract from the appearance of the base. This effect would be minimal, however, and the adverse impact of the No-Action Alternative on visual resources would not be significant.

#### 4.1.2 Proposed Action

##### 4.1.2.1 Land Use

Implementation of the Proposed Action would be consistent with the land use plan presented in the Shaw AFB General Plan (SAFB 1999). Twelve of the 17 projects included in the Proposed Action would serve to enhance or repair existing facilities on base, and/or replace a temporary or inadequate structure with a permanent structure or, in the case of the Memorial Lake Amphitheater, provide a new facility. The remaining five proposed projects are related to improvement to the Main Gate on Shaw Drive and lighting enhancements at all entrances to the base, for the purposes of improving safety and appearance. Therefore, the Proposed Action would have no significant adverse impact on land use.

##### 4.1.2.2 Transportation

The projects associated with entry control points for the base, including the Main Gate construction and other entrance gate enhancements, would serve to improve the flow of traffic entering the base and to increase safety. The proposed project that would alter the intersection of Aiken Street and Shaw Drive to accommodate traffic entering the base through the new Main Gate could have a temporary adverse effect on traffic entering the base during construction activities. However, any such impact would not be significant due to its short-term, localized nature. After the implementation of the proposed projects, the Proposed Action would have a beneficial impact on transportation facilities on and off-base.

##### 4.1.2.3 Visual Resources

The proposed projects, including the construction of the Memorial Lake Amphitheater, the Main Gate fence installation, the new Visitor Center, and the permanent gatehouse at Palmetto Heights, would all serve to improve the appearance of the existing structures on-base and enhance the visual resources already existing on the base. The existing visual resources on the base would not be significantly adversely impacted as a result of the Proposed Action.

The project to install lighting at the entrance gates (Project Map ID H6) may affect residents in areas located near the Frierson Street, Polifka Street, and Palmetto Heights

Residential Gates. The increased lighting may be considered an adverse effect by some residents living near these gates, while others may consider the increased illumination a benefit with regard to safety.

## 4.2 INFRASTRUCTURE

### 4.2.1 No-Action Alternative

Under the No-Action Alternative, current baseline demands on the infrastructure of Shaw AFB would continue as described in Section 3.2 and shown in Figure 3-4. Under current conditions, the capacities of all of the infrastructure systems and facilities generally are sufficient to meet requirements, and this would continue under the No-Action Alternative. Assuming ongoing maintenance, repair, and upgrade of infrastructure components are continued and the quality of the systems and facilities is maintained, the level of impact of this alternative on the infrastructure of Shaw AFB would be negligible.

### 4.2.2 Proposed Action

Implementation of the Proposed Action alternative would place minor additional demands on some infrastructure components at Shaw AFB. The 17 WINDO projects included in the Proposed Action are generally upgrades to existing facilities that improve defense readiness, operational efficiency, force protection, aesthetic appeal of the base, and morale of personnel. The net increase in building square footage on the base that would result from construction of the projects included in the Proposed Action is estimated to be more than 22,000 SF. In addition, the square footage of three of the projects (the WWTP operations facility, the addition to the chapel, and the visitor center) is unknown at this time due to the incompleteness of their design. Effects of the Proposed Action on each infrastructure system are described below.

#### 4.2.2.1 Electrical and Natural Gas Systems

Projects involving a net increase in building size may result in a minor increase in electricity usage. However, the electrical systems on base are served by two off-base suppliers and have reserves to meet future needs (SAFB 2004c). Adequate capacity is available within the base electrical system; current usage at peak periods is approximately 16 percent of capacity. Considering ongoing upgrades to the electrical system at Shaw AFB, this system is capable of supporting substantial growth on the installation (SAFB 1999).

The construction of additional buildings will result in a minor increase in usage of natural gas for heating and cooling, while demolition of buildings may potentially decrease consumption. A project is planned to extend the natural gas pipeline from the metering station, which divides the supply between the housing and industrial areas, to the eastern portion of Shaw AFB (SAFB 1999). This would allow for an increase in natural gas consumption on base. Nevertheless, the natural gas system has the capacity to support substantial growth at Shaw AFB.



#### 4.2.2.2 Potable Water System

The water system is currently operating at approximately 54 percent of its capacity, and is therefore capable of supporting substantial growth at Shaw AFB (Shaw AFB, 1999). However, a change in demand on the potable water system associated with the Proposed Action is not anticipated because the installation population and level of operations are expected to remain generally the same as under current conditions. For example, a new pool is planned for the proposed fitness center improvements projects (B5), but it will replace the existing pool and additional demand for potable water would likely be negligible.

#### 4.2.2.3 Wastewater System

The net wastewater flow associated with the Proposed Action is expected to remain approximately the same as under existing conditions. The Proposed Action includes construction of new facilities; however, the majority of these projects are expansions or replacements of existing facilities, and the population of the base is not expected to increase significantly. Several recent improvements have been made to the base wastewater system including the addition of an equalization basin to the WWTP to accommodate heavy flows due to rainfall, sewer line replacement throughout the base to reduce infiltration and inflow into the system, and the replacement of several lift pump stations (SAFB, 1999). The proposed new WWTP operations facility (A49) may lead to improved efficiency in wastewater treatment by providing additional space for maintenance and repair of equipment. Other projects (not associated with the Proposed Action) are also planned, including replacement of existing sewer lines on the base and the extension of the wastewater system to the east side of Shaw AFB. Given that the current wastewater system is operating at 67 percent of its capacity, it is capable of supporting moderate growth at Shaw AFB (SAFB 1999), including the expansion of the system to the east side of the base. The proposed construction on the east side of the base is not expected to generate any industrial wastewater flow into the existing septic tanks.

#### 4.2.2.4 Solid Waste Collection System

An estimated 41,911 square feet of buildings (USCENTAF Communications Squadron Facility and CATM Facility) would be demolished as part of the Proposed Action. The exact volume of solid waste generated from this demolition is unknown; however, both facilities being demolished are single story buildings. The contractor hired to demolish the buildings may choose to recycle the debris; otherwise, the waste would be disposed of at an off-base facility (Byer 2004a). Following construction, the net change in solid waste produced by operation of the facilities included in the Proposed Action is expected to be minimal.

#### 4.2.2.5 Storm Drainage System

Construction of new buildings and building additions and paving of parking lots will increase the existing on-base impervious area, creating more storm water flow for the

drainage system. Removal of existing parking lots and buildings will decrease impervious surfaces. The stormwater flow on base is expected to increase as a result of the net change in impervious surfaces or “land under facilities” resulting from the WINDO projects. A minimum increase of approximately 20,000 SF of impervious surface is estimated after the completion of all of the WINDO projects included in the Proposed Action. This estimate is less than the estimate of more than 22,000 SF of building space to be added under the Proposed Action because it accounts for the fact that some projects would be constructed on existing pavement, would involve demolition of existing structures, or would be more than one level.

This increase of 20,000 SF would be a 0.065% increase in the total area of impervious surfaces (30,884,040 SF) on Shaw AFB. This estimate includes the net gain of impervious surface from the following proposed projects: the Memorial Lake Amphitheater (A8), the PMEL addition (A25), the addition to B710 (A28), the USCENTAF Communications Squadron Facility (B4), and the addition to the Fitness Center (B5). The proposed new CATM Facility (A51) would add an additional 3,150 SF of impervious surface to the base; however, the new construction would replace an existing parking lot, and no net change in impervious surface would result. Due to the incompleteness of their design, the potential amounts of impervious areas are not currently available for the following construction projects: the WWTP Facility (A49), the education addition to the Chapel (A66), and the Visitor Center (H5).

With minor enhancement of flow capacity and expansion into newly developed areas, the storm drainage system at Shaw AFB can support substantial growth (SAFB 1999). No new outfalls are being constructed to accommodate additional stormwater runoff resulting from the WINDO projects (Singleton 2004). As discussed above, the net gain of impervious surfaces would be relatively small. Therefore, the current storm drainage system at Shaw AFB could support any increases in stormwater flow resulting from the WINDO projects.

#### **4.2.2.6 Heating and Cooling Systems**

Projects included in the Proposed Action that involve a net increase in building size may result in a limited need for additional heating and cooling capacity. However, buildings and other facilities would be planned with energy efficient designs and improved connections and distribution systems, reducing demand for heating and cooling. The existing central heating systems are sufficient to support all existing requirements and have the capacity to support substantial growth on the installation (SAFB 1999). Individual cooling systems can be installed as needed.

#### **4.2.2.7 Liquid Fuels System**

The WINDO projects included in the Proposed Action would not appreciably change the demand on the liquid fuel system. Jet fuel is not used in any of the proposed facilities. Gasoline and diesel fuel consumption are expected to remain the same as under existing conditions on the base.

#### 4.2.2.8 Communications System

Projects included in the Proposed Action that involve changes to buildings will require reconfiguration of the communication system wiring. New facilities and building additions will require new system connections. The base communications system has adequate capacity to support existing demands as well as the minor increase in demand potentially associated with the Proposed Action.

#### 4.2.2.9 Summary

There would be no significant adverse impacts from the Proposed Action on the infrastructure systems and facilities on Shaw AFB. As shown in Figure 3-4, the major utility systems on base have extensive available capacity remaining. In some cases, impacts on infrastructure would be beneficial; for example, increases in efficiency would reduce energy demands. Due to the expansion of existing facilities and construction of new facilities, however, the overall impact of the Proposed Action would increase energy demands. This would not be a significant impact because of the extensive excess capacity of the base electrical system (Figure 3-4). The administrative facility proposed for the Poinsett ECR would replace an existing facility and would not involve changes to the existing infrastructure. In summary, there would be no significant adverse impacts on the infrastructure of Shaw AFB from implementation of the Proposed Action.

### 4.3 SOCIOECONOMICS AND ENVIRONMENTAL JUSTICE

#### 4.3.1 No-Action Alternative

Under the No-Action Alternative, the facilities included in the proposed WINDO projects would not be constructed, and the effects of activities at Shaw AFB on population levels, employment, and earnings in the ROI would remain the same as described for the existing environment. Therefore, the No-Action Alternative would have no significant adverse impacts on socioeconomic conditions or environmental justice concerns.

#### 4.3.2 Proposed Action

##### 4.3.2.1 Socioeconomics

Construction and operation of the proposed WINDO projects would have no appreciable effect on the population of Sumter County. The workers employed to construct the facilities are expected to be local or regional residents. Staff levels associated with the proposed facilities would be similar to current levels, given that most of the projects are replacements for or additions to existing facilities.

Economic activity associated with construction of the proposed WINDO projects would provide short-term benefits to the local economy. Estimated construction expenditures for the proposed WINDO projects are approximately \$24 million. Construction of the

proposed projects would require goods and services from the private sector within the Shaw AFB ROI and would have a minor beneficial effect on regional employment. Operation of the proposed WINDO projects, once construction is complete, would provide a minor economic benefit to the Shaw AFB region. The proposed projects would not appreciably alter long-term employment opportunities because the projects generally involve enhancing activities currently occurring at Shaw AFB rather than introducing additional new functions.

In summary, the Proposed Action would have a minor beneficial impact on socioeconomic resources.

#### 4.3.2.2 Environmental Justice

Environmental justice, which concerns the disproportionate effect of a federal action on low-income and minority populations, focuses on residents living within the areas where there would be potentially adverse environmental impacts resulting from the Proposed Action. The proposed WINDO projects are located within Shaw AFB and would have no adverse effects on any off-base areas. Accordingly, there would be no environmental justice issues associated with the Proposed Action.

### 4.4 CULTURAL RESOURCES

#### 4.4.1 No-Action Alternative

Under the No Action alternative, the cultural resources of Shaw AFB and Poinsett ECR would continue to exist and receive protection as described in Section 3.4. There would be no significant adverse impact on cultural resources as a result of the No Action alternative.

#### 4.4.2 Proposed Action

There are no NRHP-listed cultural resources at Shaw AFB, and only one resource, B611, has been declared eligible for listing on the NRHP. This hangar is located near the southern end of the flightline and is more than 2,000 feet from the nearest proposed WINDO project included in the Proposed Action (the addition to the existing PMEL B826). Additionally, one building located on Poinsett ECR, the Rosemary Fire Tower, has been declared eligible for the NRHP. The single proposed project on Poinsett ECR (constructing an Administrative Facility to replace the existing trailer) is located on Blacktop Road more than two miles north of the Rosemary Fire Tower.

No eligible or potentially eligible archaeological resources are located at Shaw AFB. Three archaeological sites on the base have not been assessed for NRHP eligibility (SAFB 2001c). However, these three sites (SU61, SU62, and SU63) are not located in close proximity to any of the WINDO projects included in the Proposed Action (Figure 3-6). SU61 is located in the northern area of the base, north of the residential areas and in the vicinity of an industrial area. SU62 is located in the area just south of the



northernmost residences located on the base, and east of the outdoor recreation area located in the northwestern portion of the base. SU63 is located northeast of the hospital, in the vicinity of the Gardenia Drive and Myers Street intersection.

Under the Proposed Action, all construction activities would be performed in areas that have already been developed. In addition, all areas of the base have been surveyed for cultural resources, and none of the proposed facilities would be on or adjacent to known or potential cultural resource locations. If unanticipated cultural resources were to be encountered during construction, procedures outlined in the CRMP would be followed.

The Proposed Action would not impact known cultural resources on Shaw AFB or Poinsett ECR, and there is only a minimal potential for the Proposed Action to impact undiscovered cultural resources at Shaw AFB as a result of excavation during construction activities. Thus, the Proposed Action would have no significant adverse impact on cultural resources. Concurrence with this conclusion was received from the SHPO following their consultation and review of the Draft EA (see Appendix B).

#### 4.5 BIOLOGICAL RESOURCES

This section describes the consequences for the biological environment at Shaw AFB and Poinsett ECR from the implementation of each alternative.

##### 4.5.1 No-Action Alternative

The No-Action Alternative would result in negligible to low levels of impact on various attributes of the biological environment of Shaw AFB and surrounding areas.

The existing habitat types and associated flora and fauna of the base would be impacted at negligible to low levels by the No-Action Alternative. The presence of the base and the performance of the many operational activities essential to its missions inevitably have adverse effects on certain species and habitats. Continuation of current mission activities and use of current facilities would be expected to continue to affect communities and species, both terrestrial and aquatic.

Aquatic communities would continue to be impacted at low levels by stormwater runoff from existing facilities and other discharges to water bodies. Soil erosion can impact stream habitats, and aquatic habitats and their biota also may be affected by the discharge of wastewaters from the base. All wastewaters, other than stormwater runoff, are treated prior to their discharge. The permitted treatment facilities would continue operating under the No-Action Alternative; therefore, wastewater discharges would have only a low level of impact on aquatic habitats and biota.

Terrestrial communities and their biota would be affected by ongoing natural resource management and landscape maintenance activities on the base. Overall, continued implementation of these management practices at existing facilities would have impacts on existing communities and biota of the base ranging from beneficial to negligible.

As discussed in Section 3.5.3, only one ETSC species, the least tern, occurs on Shaw AFB. This threatened species is being monitored on the base, and efforts are being made to minimize disturbance to the colony site (SAFB 2001d). No ETSC species occur in the administration area in the northern portion of Poinsett ECR.

Thus, evaluation of the ecological effects that would continue to occur under the No Action Alternative indicates that there would not be significant adverse impacts on biological resources.

#### 4.5.2 Proposed Action

Implementation of the Proposed Action would result in negligible changes in the levels or types of impacts to biological resources that were previously described under the baseline conditions of the No-Action Alternative. All of the proposed WINDO projects would be located in areas of Shaw AFB or Poinsett ECR that are already developed or of limited habitat value. It is unlikely that activities under this alternative would adversely affect resident wildlife sufficiently to reduce population levels, although distributions of species on the installation may be temporarily affected as sensitive species avoid areas of high noise exposure from construction activity.

None of the proposed projects would be located in a wetland area (Figure 3-7), and effects on ETSC species under this alternative would be essentially the same as described for the No Action Alternative. None of the ETSC species on Poinsett ECR occur in the northern part of the range on or near the administration area where the new Administrative Building would be constructed under the Proposed Action. The only ETSC species recorded on Shaw AFB, the least tern, has previously nested on the roof of the BX building. The BX building is located in the middle of the developed western part of the base, approximately 500 feet south of the No. 8 Hole Golf Course Pond and 1,000 feet west of the flight line. The closest of the proposed WINDO projects is the construction of the Memorial Lake Amphitheater at a site approximately 1,400 feet southwest of the BX. Given the terns' selection of a nesting site in a very active area of the base and closer to the flight line than to any of the proposed facility locations, construction and use of the proposed WINDO projects is not expected to adversely affect the least tern population on the base. Thus, there would be no adverse impacts on wetlands or ETSC species from the Proposed Action. Concurrence with these conclusions was received from SCDHEC and USFWS, respectively, following their consultation and review of the Draft EA (see Appendix B).

The consequences of the Proposed Action for the biological resources of Shaw AFB and Poinsett ECR would not differ appreciably from those of the No-Action Alternative. Certain species may be impacted at a low level under the Proposed Action by effects from construction activities, such as land clearing for new construction, sedimentation, tree removal, or noise. However, evaluation of the context and intensity of these ecological effects indicates that they would not result in significant impacts on biological resources.

## 4.6 WATER RESOURCES

### 4.6.1 No-Action Alternative

Under the No-Action Alternative, ongoing monitoring and permitting of wastewater and stormwater discharges to surface waters in the vicinity of the base would continue, and ongoing programs to prevent spills and other sources of groundwater contamination would continue. Consequently, there would be no significant adverse impacts to water resources under the No-Action Alternative.

### 4.6.2 Proposed Action

The execution of the proposed WINDO projects would involve activities such as clearing of vegetation, grading, filling, demolition of existing buildings and pavement, and construction of new buildings, pavement, and fencing. These activities have the potential to affect water resources and their ecological functions. For example, removal of vegetation may cause increased overland flow velocities, increased land surface erosion, increased sediment load in surface waters, and alterations in water storage.

Grading has the potential to alter overland flow velocity and direction due to changes in slope, increase land surface erosion, increase sediment load in surface waters, decrease water storage, and alter biogeochemical cycling by changing soil permeability characteristics. Filling also may alter water storage and flow functions and affect biogeochemical cycling. Demolition may release pollutants, which could be carried to surface waters by overland flow or stormwater conveyances. Construction may result in an increase in impervious surface in a given location, which can cause increased runoff volume and velocity, loss of functions associated with vegetative cover, and loss of water storage.

Impacts from clearing, grading, and demolition would be temporary. Re-establishment of vegetation and stabilization of disturbed soils would minimize impacts caused by those activities. Certain impacts on water resources from construction would be ongoing during the life of the facility; for example, increases in impervious surfaces and resulting stormwater runoff, losses of vegetative cover, and reductions in water storage capacity. These effects would be cumulative as additional projects are constructed.

However, given that most of the proposed construction activities would occur in developed areas of the base, actual impacts on water resources from the Proposed Action would be minimal. There are no extensive stands of natural vegetation remaining within the project areas. The majority of potentially impacted vegetation is sparse. Sedimentation may temporarily occur during grading operations, but these impacts would be mitigated with appropriate erosion and sedimentation control measures. Stormwater runoff from the base enters Long Branch and Mush Branch through NPDES-permitted stormwater outfalls around the base perimeter, and monitoring of these discharges would continue under the Proposed Action.

Infiltration and runoff may vary locally from existing conditions depending on whether a project involves construction, demolition, or both. However, changes in overall volumes of stormwater and wastewater discharged, and their ultimate effects on the surface waters at Shaw AFB and Poinsett ECR, are expected to be minimal. As discussed in Section 4.2.2, the net gain of impervious surface is expected to somewhat exceed 20,000 SF, a relatively minor increase. All construction activities would occur outside of the limits of the 100-year floodplain (SAFB 1999).

In compliance with the Shaw AFB Stormwater Pollution Prevention Plan (SWPPP) (SAFB 1998), prior to the start of any construction, silt fences, storm drain inlet and outlet protection, and other pollution prevention construction practices would be used to prevent erosion, sedimentation, and stormwater or other discharges from the site. The proposed WINDO projects would be designed in accordance with AFI 32-7041 (Water Quality Compliance) and are expected to include in their design stormwater management features to remove sediment and other pollutants, reduce flow velocities, promote rapid infiltration and sheet flow rather than channelization, and divert runoff from flowing over potential sources of pollutants, such as industrial areas. For proposed construction projects that would disturb more than one acre of land, a construction NPDES permit would be required in addition to the base's current general NPDES permit (SCDHEC 2001). Additionally, modifications to the existing SWPPP may be necessary with regard to control of sedimentation, erosion, and stormwater discharges.

Groundwater in the vicinity potentially could be adversely affected by increases in impervious surface area as a result of the Proposed Action, which could reduce infiltration of stormwater and recharge of aquifers in the project areas. However, as mentioned above, the area of impervious surface is expected to increase only minimally as a result of the Proposed Action. Compliance with the updated SWPPP would continue, and stormwater management systems implemented in conjunction with the proposed projects, such as stormwater detention basins, would reduce any impacts on groundwater recharge.

In summary, the Proposed Action would not have significant adverse effects on water resources.

#### 4.7 AIR QUALITY

Air emissions resulting from the Proposed Action and No-Action Alternative were evaluated in accordance with federal and state air pollution regulations. The air quality impacts from a proposed activity or action are considered significant if they:

- Increase ambient air pollution concentrations above any NAAQS;
- Contribute to an existing violation of any NAAQS;
- Interfere with or delay timely attainment of NAAQS; or
- Impair visibility within any federally mandated PSD Class I area.

The base holds a state air permit that authorizes construction and operation of air emission sources as specified in the permit.

#### 4.7.1 No-Action Alternative

Under the No-Action Alternative, the buildings and facilities associated with the proposed WINDO projects would not be constructed, and air emissions would remain the same as under existing conditions. Consequently, there would be no significant adverse impacts to local or regional air quality under the No-Action Alternative.

#### 4.7.2 Proposed Action

##### 4.7.2.1 Operational Air Emissions

The 17 proposed WINDO projects included in the Proposed Action would not substantially change existing operational emissions and, therefore, would not increase ambient concentrations of air pollutants in Sumter County. All of the WINDO projects either replace or enhance existing facilities (e.g., construction of new facilities; upgrade, repair and alterations of facilities and infrastructure; replacement and expansion of facilities; and demolition of facilities).

Sumter County is designated as “attainment” for meeting the national and state ambient air quality standards for the criteria pollutants. There are no PSD Class I areas near Shaw AFB. There is no substantial increase or change in operational activities associated with the Proposed Action that would adversely affect air quality in Sumter County. There are no increases or changes in aircraft types or quantities, aircraft maintenance operations, base operations, base facility maintenance operations, or the number of base personnel using motor vehicles.

The Shaw AFB Title V Operating Permit requires the base to annually report an air emissions inventory. In addition, it requires a new permit for any changes of equipment or fuel listed in the permit or the relocation of equipment listed in the permit. None of the proposed WINDO projects would require a new permit.

Consequently, air emissions associated with operation of the WINDO projects included in the Proposed Action would have no significant adverse impacts on air quality.

##### 4.7.2.2 Construction Air Emissions

Construction activities associated with the proposed WINDO projects at Shaw AFB would include grading, paving, and demolition and construction of facilities. It is assumed that these construction activities would occur over a five-year period with up to one-third being constructed at the same time. These activities would produce short-term emissions primarily from internal combustion engines, asphalt concrete paving, fugitive dust, and architectural surface coatings, which would cease once construction is completed.

Solvents used in architectural surface coatings create VOCs that are emitted during application and as the coating dries. Since the use of organic solvents in architectural surface coatings is the primary source of emissions, using low-solvent-content waterborne and powder coatings can minimize emissions from this source.

Asphalt concrete is grouped into three general categories: hot-mix, cutback, and emulsified. Hot-mix asphalt use produces minimal emissions of VOCs and HAPs while cutback asphalt produces high VOCs and HAPs. Emulsified asphalt produces less VOCs and HAPs than cutback asphalt. Hot-mix asphalt would be used for the paving associated with the proposed WINDO projects (Byer 2004b).

A soil survey has not been conducted on the base. However, based on descriptions of the soils surrounding the base, the soils on the base are expected to be sandy-textured (USDA 1974). Sandy-textured soils have a low potential to become airborne particulates. In addition, the climate is humid and moist. Keeping disturbed ground and demolition sites moist using water trucks and sprinklers through construction specifications can easily control any fugitive dust produced by grading and demolition activities.

Internal combustion engines from construction equipment are the major source of emissions. Non-road diesel-powered, construction equipment currently has minimal emission controls. (However, such equipment will have substantial improvements starting with the 2008 model year and non-road diesel fuel will be substantially cleaner starting in 2007.)

A simple dispersion model was used to provide an approximate measure of the impact of construction-related air emissions to the air shed over the base. Appendix C presents the data and assumptions used to calculate construction-related emissions. The impact of construction emissions are expected to be small due to the relatively small scale of the individual WINDO projects coupled with the multi-year time period in which project construction would take place. Because of these factors, a simplified analysis was conducted, and the results were sufficient to demonstrate that the impact of construction emissions at the base would be negligible.

Because internal combustion engines from construction equipment are the major source of emissions and the dispersion model is conservative, only internal combustion engine emissions were modeled (i.e., hydrocarbon [HC], CO, NO<sub>x</sub>, PM<sub>10</sub>). Table 4-1 lists maximum air pollutant concentrations at the base associated with construction of the proposed WINDO projects (i.e., calculated 1-hour concentration of construction equipment emissions). In order to estimate the incremental effect of construction-related air emissions on local air quality, Table 4-1 also presents existing levels of the four modeled air pollutants (ambient air monitor values), the total resulting concentrations (i.e., calculated 1-hour concentration plus existing ambient air concentration) and the percent increase in concentration, as well as the applicable federal and state air quality standards.

**Table 4-1. Evaluation of Construction-Related Air Emissions**

<b>Pollutant</b>	<b>Existing Ambient Air Monitor Value<sup>a</sup> (mg/m<sup>3</sup>)</b>	<b>Calculated 1- hour concentration of construction equipment emissions (mg/m<sup>3</sup>)</b>	<b>Total Resulting Concentration (mg/m<sup>3</sup>)</b>	<b>Percent Increase in Concentration</b>	<b>Federal and State Standard (mg/m<sup>3</sup>)</b>
HC	n/a	0.0000000074	n/a	n/a	none
CO	5.27 <sup>b</sup>	0.0000000190	5.27	< 0.01%	40
NO <sub>x</sub>	0.026 <sup>c</sup>	0.0000000878	0.026	< 0.01%	0.100
PM <sub>10</sub>	0.035 <sup>d</sup>	0.0000000095	0.035	< 0.01%	0.05

<sup>a</sup> From EPA Monitor Values Report for South Carolina, Year 2003 (USEPA 2004)

<sup>b</sup> Maximum recorded 1-hour value, Site ID 450190005 (Charleston)

<sup>c</sup> Maximum recorded annual mean for NO<sub>2</sub>, Site ID 450450008 (Greenville)

<sup>d</sup> Maximum recorded annual mean, Site ID 450790018 (Columbia)

n/a Not available

The calculated 1-hour concentration represents a negligible (much less than 0.01 percent) increase over the ambient concentration, and the resulting concentration is well below the federal and state standards. These results were obtained with a simple model and with several conservative approximations. It can be concluded that air quality effects of construction activities is negligible both in the immediate vicinity of the base and in the surrounding areas. Therefore, the construction-related effects of the Proposed Action would not result in significant adverse impacts on air quality.

## 4.8 HAZARDOUS MATERIALS AND WASTE MANAGEMENT

### 4.8.1 No-Action Alternative

Under the No-Action Alternative, management of hazardous materials and wastes on Shaw AFB would continue as described in Section 3.8. In addition, in the absence of the Proposed Action, minor deficiencies related to hazardous materials and waste management would continue. Specifically, the existing WWTP would continue to be an inadequate facility for operations equipment and personnel, resulting in continued violation of USAF regulations regarding utilization of a hazardous material, pesticides. The existing WWTP operations are co-located in the same building with the Entomology Shop, violating USAF regulations that prohibit co-use of a facility that utilizes pesticides and does not have a secure vapor-imperious partition. Also, the bullet trap system at the small arms range would not be improved, resulting in continued soil contamination with lead from bullets fired into the earthen backstop. These relatively minor issues involving the use/storage of hazardous materials and the generation of hazardous waste, although adverse, are not significant impacts.

#### 4.8.2 Proposed Action

Under the Proposed Action, there would be minor beneficial and adverse impacts associated with hazardous material and waste management on Shaw AFB. Benefits would result from the construction of a new WWTP Operations Facility (A49), which would result in the base being in compliance with USAF regulations regarding pesticide storage. Also, repair of the bullet trap system (A33) at the CATM Facility would result in the prevention of soil contamination by lead.

Adverse impacts would result from the generation of hazardous waste in conjunction with some proposed projects. Many of the buildings at Shaw AFB are old enough to potentially contain ACM and LBP. Some buildings are known to contain ACM, including the 11 buildings proposed for demolition in the proposed USCENAF project (B4). ACM would need to be identified and managed in accordance with the *Asbestos Management Plan* (USAF 2003b). Asbestos is known to be present in B1846, the CATM facility, and the building has been condemned. The proposed project to construct a new CATM Facility (A51) would replace the current, asbestos-contaminated building. After construction of the new facility, the old building will be either renovated or demolished, resulting in the generation of ACM waste. Additionally, lead-based paints would be identified and managed in accordance with the Shaw AFB *Lead-Based Paint Management Plan*. Thus, all buildings proposed for renovation or demolition under the Proposed Action would be surveyed for ACM and LBP.

Because some of the buildings proposed for renovation or demolition under the Proposed Action have not been surveyed for ACM and LBP, the amounts of hazardous waste that would be generated as a result of the Proposed Action cannot be quantified. However, the generation of hazardous waste associated with the Proposed Action would be short term, occurring only during the renovation or demolition of structures within the five-year time frame of the Proposed Action. And given the limited number and size of the buildings that may be involved, the magnitude of the waste that would be produced is expected to be minor.

The only existing USTs that may be affected under the Proposed Action are at the Airman Dormitory Heating Plant (B403), which is in the vicinity of Airman Dormitory Parking that would be replaced by a project to construct new dormitory parking (H11). These USTs (Shaw ID 00403-01 – 04) have been closed in place and were used to store heating oil. USTs 00403-01 and 00403-02 have a 25,000 gallon storage capacity, while USTs 00403-03 and 00403-04 have a 10,000 and 5,000 gallon storage capacity, respectively (Mulholland 2004). Development and construction of this project would be coordinated with the Environmental Flight to insure that the USTs are either removed or not affected.

ERP sites would potentially be affected only by proposed projects located nearby. The following ERP sites are near a proposed project to construct a new WWTP Operations Facility (A49) adjacent to the existing WWTP on the western perimeter of the base (Figure 3-8).



Two of these ERP sites (SS-31 and OT-16A) are groundwater contamination plumes beneath the existing WWTP. SCDHEC approved closure of SS-31 and has transferred the nitrate/nitrite issue to the jurisdiction of the SCDHEC Bureau of Drinking Water (USAF 2003c). Additionally, ERP Site No. OT-16A (Building 325) is a 23.5-acre dieldrin-contaminated groundwater plume that extends off-base beneath the Carolina Mobile Home Park.

**Table 4.2. ERP Sites Near the Proposed Action**

Site No.	Site Name	Contaminant	Status
OT-16A	Building 325	Dieldrin	Pending Closure
SD-02	CE Complex Drainage Ditch	Diluted pesticides and herbicides	Closed
SD-23	Oil Separators	Waste oil and jet fuel	Pending Closure
ST-24	Oil accumulation tank	Waste oil	Closed
SS-10	Building 327	Battery acid	Closed
SS-31	Spill site (Building 337)	Nitrates/Nitrites	Closed

A general location for the new WWTP Operations Facility has been identified; however, the exact location of the facility has not yet been specified. Depending on the location of the new facility, one or more of the ERP sites in Table 4-2 may be near the project. However, there are no land use restrictions listed for those sites in the *Shaw AFB Environmental Restoration Program Management Action Plan* (USAF 2003c). In accordance with ACC policy, construction associated with the WWTP Operations Facility would be closely coordinated with the base ERP manager and SCDHEC to ensure that ERP sites are not adversely affected. Given that only one of the projects included in the Proposed Action is located near an ERP site, that the ERP sites potentially near this project are all closed or pending closure, and that the locations of these sites would be considered in final siting decisions regarding this project, it is concluded that there would be no significant adverse effects associated with hazardous waste sites as a result of the Proposed Action.

In summary, the effect of the Proposed Action on hazardous materials and waste would be beneficial in some respects and adverse in others. However, none of these impacts would be significant.

## 4.9 SAFETY

### 4.9.1 No-Action Alternative

The No-Action Alternative would result in the continuation of existing safety conditions at Shaw AFB, as described in Section 3.9. Due to the extensive safety programs and measures currently in place at Shaw AFB, there is a low level of hazard to military and civilian personnel on the base and in the region.

General operational safety would continue to be maintained through adherence to safety regulations prescribing measures, processes, and procedures to ensure safe operations in all aspects of daily activity at the base.

Current safety provisions regarding munitions storage and handling would continue as described in Section 3.9.2, and explosive safety (Q-D) zones would continue to be maintained around those areas on the base where munitions are stored and handled. An existing safety issue related to munitions is the use of the small arms firing range on the eastern perimeter of the base. An earthen backstop currently serves as a bullet trap to prevent bullets (9 mm and 5.56 mm ammunition) from exiting the range. However, the condition of the backstop allows rounds to ricochet out of the range, increasing the SDZ and VDZ in the immediate vicinity of the range. Under the No-Action Alternative, repair of this bullet trap (A33) would not occur. Consequently, the potential for rounds to exit the range and the associated SDZ and VDZ would not be reduced, resulting in an ongoing risk to the safety of persons adjacent to the firing range during small arms training.

Current flight safety procedures and requirements under the No-Action Alternative, including airfield clearance requirements, airspace safety provisions, and maintenance of safety zones at each end of the airfield, would continue as described in Section 3.9.2.

Force protection under the No-Action Alternative would continue as described in Section 3.9.2, and the deficiencies associated with the existing gate facilities also would continue. The Main Gate on Shaw Drive is located adjacent to an off-base wooded area to the west and does not provide adequate space for search and inspection of suspect vehicles. The current location of the Main Gate also causes traffic to back up onto US 76/378, increasing the potential for vehicle accidents. The gatehouse at the entrance to the Palmetto Heights housing area is a temporary facility installed after 9/11/01 and does not meet the requirements of security forces personnel. In addition, lighting at all gates controlling access to the base is poor and hinders the deterrence of possible attacks.

Thus, the No-Action Alternative would have adverse effects on certain aspects of safety at Shaw AFB. However, these effects would not be significant in the context of the overall beneficial impacts of the extensive safety programs and procedures employed on the base under existing conditions.

#### 4.9.2 Proposed Action

##### 4.9.2.1 General Operational Safety

Under the Proposed Action, new facilities would be constructed and some existing facilities would be modified or upgraded. However, no construction or modification activities would involve any unusual or extraordinary techniques. During construction, best management practices would be employed, and standard industrial safety requirements and procedures would be enforced, thereby minimizing any safety risks associated with these activities.

Construction of the proposed projects would involve activities that could expose workers performing the required site preparation, grading, and building construction/demolition to some risk. The U.S. Department of Labor (DOL) Bureau of Labor Statistics maintains data analyzing fatal and non-fatal occupational injuries based on occupation. Due to the varying range of events classified as non-fatal injuries, the considerations described below focus on fatal injuries since they are the most catastrophic. Data are categorized as incidence rates per 100,000 workers employed (on annual average) in a specific industry, categorized by a Standard Industrial Classification (SIC).

In the assessment of relative risk associated with the proposed construction projects, it was assumed that the industrial classification of the workers involved is the Construction Trades (SIC 15, 16, and 17). In 2002, there were 1,121 construction-related fatalities, and the DOL calculated an incidence rate of 12.2 fatalities per 100,000 employed. Given the limited size of the construction projects included in the Proposed Action and the expectation of strict adherence to all applicable occupational safety requirements by construction workers on the base, the relatively low risk associated with these construction activities would be further minimized.

#### 4.9.2.2 Munitions Safety

Munitions safety under the Proposed Action generally would continue as described under existing conditions in Section 3.9. Q-D zones protecting personnel and property from areas where munitions are stored, maintained, and handled would not be encroached upon by any of the projects included in the Proposed Action. The locations of Q-D zones and proposed WINDO projects are shown in Figure 3-9.

There would be beneficial effects on safety in the vicinity of the small arms firing range at the CATM Facility. Under project A33, a new bullet trap system would be installed at the small arms range to reduce the SDZ and VDZ requirements by reducing the potential for rounds to exit the range. This project would have a beneficial impact on munitions safety in conjunction with small arms training.

#### 4.9.2.3 Aviation Safety

Current flight-safety practices, including airfield clearance requirements, airspace safety provisions and maintenance of safety zones at each end of the airfield, would not be affected by the projects included in the Proposed Action. None of the proposed projects would violate airfield clearance requirements, and none would violate or encroach upon the Clear Zones at the ends of the runways (Figure 3-9).

#### 4.9.2.4 Force Protection

Under the Proposed Action, force protection would be enhanced and safety increased. Six projects included in the Proposed Action would have beneficial impacts on safety by addressing deficiencies associated with the existing gate facilities, described in Section 3.9.2. The installation of new lighting at all Shaw AFB entry gates (H6) would help deter

possible attacks and improve force protection. The lighting would aid security personnel in spotting approaching vehicles and personnel.

A project to construct a new Main Gate on Shaw Drive (H3) would enhance force protection by relocating the gate and allowing construction of adequate vehicle inspection areas, barriers, and lighting. This project also would increase traffic safety by preventing traffic from backing up onto US 76/378 during periods of high traffic volume. In conjunction with the Main Gate project, the intersection of Aiken Street and Shaw Drive would be relocated (H9), which would decrease traffic accident potential by improving traffic flow in the vicinity of the gate. The construction of a new Visitor Center (H5) and fence (H4) adjacent to the new Main Gate would further improve the control of personnel visiting the base.

A project to construct a new Palmetto Gate at the Palmetto Heights housing entrance (H7) would enhance force protection by replacing a temporary gatehouse with a permanent facility adequate for use by security forces in controlling access to the base. Also under the Proposed Action, a project would construct new dormitory parking (H11) to comply with AT/FP requirements that parking areas be located at least 80 feet from all dormitory facilities.

#### 4.9.2.5 Summary of Safety Consequences

Under the Proposed Action, general operational safety would not be appreciably impacted by construction-related hazards. Munitions safety would be improved by a project to repair the bullet trap at the small arms range. Aviation safety would not be adversely affected by the proposed projects. Force protection would be significantly improved as a result of projects involving gates, lighting, and parking, resulting in beneficial impacts on safety. Accordingly, the overall impact of the Proposed Action of safety at Shaw AFB would be beneficial.

### 4.10 NOISE

#### 4.10.1 No-Action Alternative

Under the No-Action Alternative, existing noise levels in the vicinity of the proposed WINDO projects would remain the same as under current conditions. The No-Action Alternative would have no significant adverse impact on the noise environment at Shaw AFB.

#### 4.10.2 Proposed Action

Operational and temporary construction impacts were considered in assessing the effects of the Proposed Action on noise. Operational impacts are defined as noise impacts associated with continued operations at newly constructed or modified facilities. Temporary construction impacts are defined as impacts that occur only during the

construction of the project. Impacts from operational and temporary construction noise are discussed in detail in Sections 4.10.2.1 and 4.10.2.2, respectively.

#### 4.10.2.1 Operational Noise

Each of the proposed WINDO projects was considered to determine whether or not it would have an operational noise impact. None of the projects are anticipated to create a new noise impact to land uses adjacent to Shaw AFB. The projects do not alter the number or type of aircraft flown at the base and do not alter flight patterns. The projects do not facilitate any operations that would contribute enough noise energy to alter the AICUZ noise contours. Therefore, no land uses adjacent to Shaw AFB will be affected by ongoing, daily operational noise resulting from the WINDO projects. Moreover, none of the WINDO projects are anticipated to create operational noise impacts within Shaw AFB that are significantly different from noise levels currently experienced. Construction methods for each building should be consistent with their use and their location with respect to the 65 dB, 70 dB, 75 dB, and 80 dB contours identified in the 2004 AICUZ noise analysis. Thus the Proposed Action would have no significant adverse impact on the noise environment in regard to operational noise impacts. (As mentioned in Section 3.10, dB values presented in this EA are A-weighted levels.)

#### 4.10.2.2 Temporary Construction Noise

Temporary construction noise impacts are anticipated as a result of the proposed WINDO projects. These impacts would be of a relatively short duration and most would be confined within the boundaries of Shaw AFB. The procedure used to quantify temporary construction noise impacts is described below.

Two categories of projects were established using the types of noise sources anticipated during construction. The first category, Site-Work and Demolition, includes grading, paving, and pavement demolition activities. The second category, Building Construction, includes noises associated with typical building construction. For each category, noise levels typical of equipment used in construction were used to determine a Ldn. Noise impacts would actually vary over time as each project progresses through different construction phases. The equipment and noise levels for each category are presented in Table 4-3.

In order to create a Ldn for each category it was assumed that no construction work would occur between the hours of 10:00 pm and 7:00 am. Therefore, the 10-dB penalty associated with noise occurring in these hours was not applied. In addition, the workday was assumed to be nine hours long. Table 4-4 presents the exposure factors used to calculate an Ldn for each category; the resultant Ldn for each category is also shown.

Table 4-5 uses the Ldn for each category and uses a point source model to calculate noise contours associated with the construction noise for each project. Peak construction noise levels will exceed the AICUZ aircraft noise contours in the immediate vicinity of each project. As the noise energy from each project dissipates with distance, the AICUZ

contours will best represent the noise environment. Again, it should be noted that the construction noise contours reflect temporary impacts and are not long-term.

**Table 4-3. Noise Levels of Construction Equipment**

Project Category	Equipment	Sound Level (dB)*
Building Construction	Backhoe	93
	Hammer	95
	Portable Saw	102
Site-Work and Demolition	Bulldozer	96
	Backhoe	93

\* Noise levels from "Construction Noise Hazard Alert", The Center for Protection of Workers' Rights, Building and Construction Trades Department, AFL-CIO. Presented in decibels in A-weighted scale and assumes human receivers adjacent to equipment. Sound levels shown are the upper end of the range.

**Table 4-4. Construction Noise Model Exposure Factors**

Project Category	Exposure Duration by Source	Ldn (dB)*
Building Construction	Backhoe only for 1 hr	93
	Portable Saw only for 2 hrs	
	Hammer only for 2 hrs	
	Hammer and saw for 2 hrs	
	No major noise activities for 2 hrs	
Site-Work and Demolition	Backhoe and bulldozer for 4 hrs	91
	Backhoe only for 3 hrs	
	No major noise activities for 2 hrs	

\* Assumes equipment noise is constant through hours of operation noted.

**Table 4-5. Temporary Construction Noise Contours**

Project Category	Temporary Construction Noise Contours	
	Ldn Contour (dB)	Distance from Source (feet)
Building Construction	80	58
	75	103
	70	182
	65	325
	80	36
Site-Work and Demolition	75	64
	70	114
	65	203

Temporary construction noise contours are shown in Figure 4-1. Using these temporary construction noise contours and the location of the proposed WINDO projects, residential uses and outdoor recreation uses experiencing greater than 65 dB of construction noise were identified. Commercial and business uses experiencing greater than 70 dB of

construction noise also were identified. Airfield, industrial, or aircraft operations and maintenance facilities were not evaluated for construction noise impacts because of the existing elevated noise levels of their operating environment. The projects listed for the east side of the base are not anticipated to impact any residential or community commercial areas. All of these projects are located in areas designated as airfield, industrial, or aircraft operations and maintenance. Temporary construction impacts to these buildings can be seen in Figure 4-1. Temporary construction noise impacts to commercial and residential areas do result from projects on the west side of the base and the Main Gate area. These temporary construction impacts are included in Table 4-6.

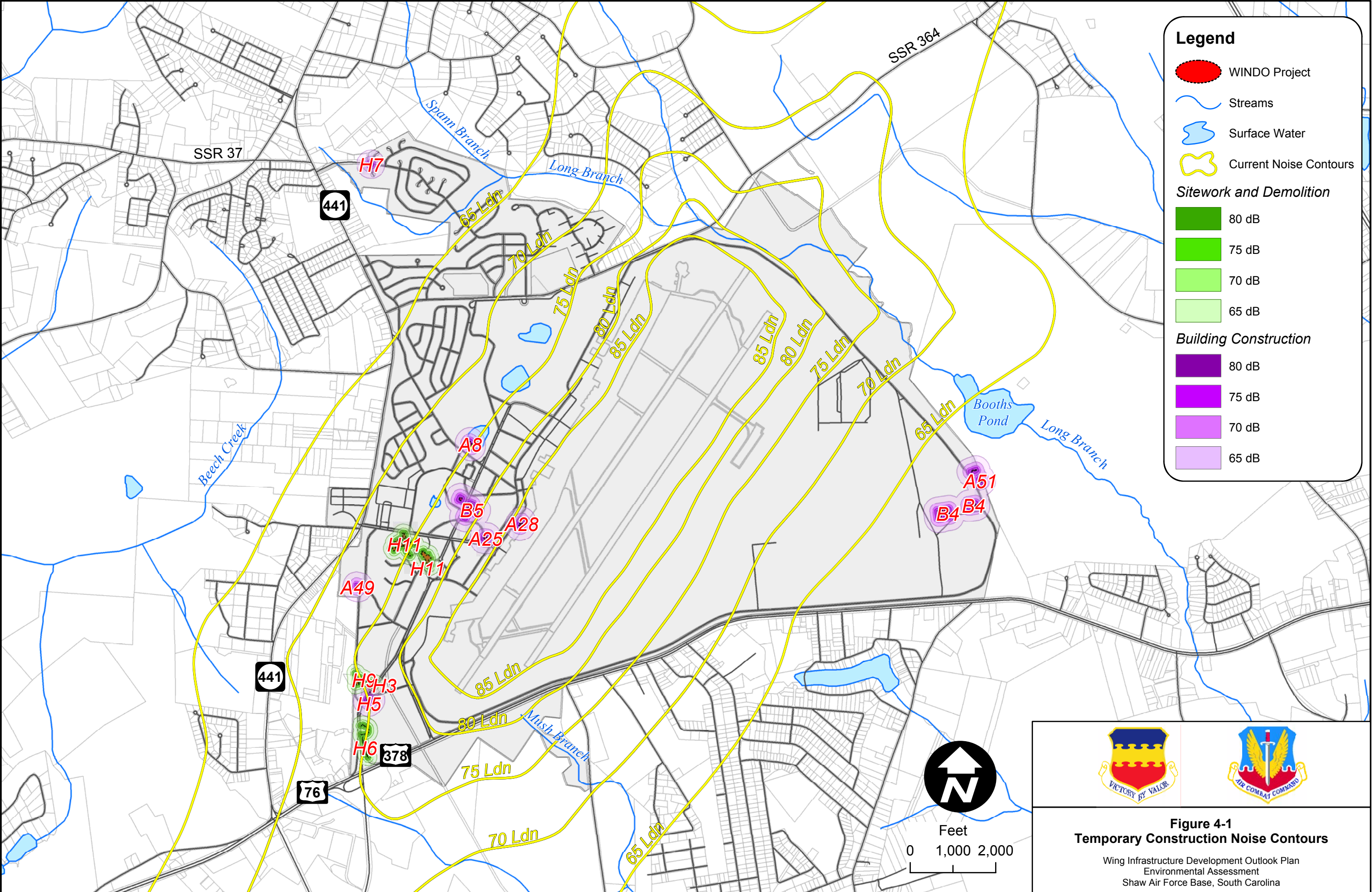
**Table 4-6. Temporary Construction Noise Impacts**

<b>Project Map ID</b>	<b>Project Title</b>	<b>Temporary Construction Noise Impacts</b>
<u>West Base</u>		
A8	Construct Memorial Lake Amphitheater	65-70 dB impact to recreation-related structures B1300 and B1302.
A25	Construct addition to the Precision Measurement Equipment Laboratory (PMEL)	65-70 dB impact to the Arts and Craft Center (B822) and Burger King (B823).
A28	Construct Addition to Intelligence Flight Building (B710)	65-70 dB impact to the Special Operations Recreational Pavilion (B702).
A49	Construct WWTP Operations Facility	65-93 dB impact to CE-related facilities.
A66	Construct Educational Addition to Main Chapel	65-75 dB impact to Woodland Pool House (B918) and Base Fitness Center (B806)
B5	Construct Addition to Fitness Center	65-70 dB impact to Arts and Craft Center (B822) and Palmetto Chapel (B913), 65-75 dB impact Base Post Office (B801), and 65 dB impact to Airman Dormitory (B908).
H11	Construct Dormitory Parking	65-93 dB impact to seven Airman Dormitories, Base Library (B-405), and 65-70 dB impact to Friendship Chapel (B206).
<u>East Base</u>		
A33	Repair Bullet Trap (B1833) at the CATM Facility	70-80 dB impact to ACOMS-related facilities, and 70-93 dB impact to small arms training facility.
A51	Construct New CATM Facility	No impact to any sensitive area.
B4	Construct USCENAF Communications Squadron Facility	No impact to any sensitive area.

Project Map ID	Project Title	Temporary Construction Noise Impacts
<u>Entrance Gates</u>		
H3	Construct Main Gate	No impact to any sensitive area.
H4	Install Fence at Main Gate	No impact to any sensitive area.
H5	Construct New Visitor Center	No impact to any sensitive area.
H6	Install Lighting at Entry Gates	No impact to any sensitive area.
H7	Construct Permanent Gate at Palmetto Heights	65-80 dB impact to 23 residences, 65 dB impact to Youth Center (B5232).
H9	Alter Intersection of Aiken Street and Shaw Drive	65-70 dB impact to six residences.
<u>Poinsett Electronic Combat Range</u>		
A52	Construct Administrative Facility, Poinsett ECR	No impact to any sensitive area.

In addition to the noise impacts listed above, increased heavy truck traffic during construction and demolition would contribute to the overall noise associated with the WINDO projects. No specific noise attenuation is recommended since these construction noise impacts are temporary and will be of relatively short duration. Moreover, assuming the proposed WINDO projects are not all constructed over the same time frame, the noise sources will be scattered throughout the base and will not occur simultaneously. Therefore, although some temporary adverse noise impacts are anticipated to occur, they are not considered significant, and the Proposed Action would have no significant adverse impact on the noise environment at Shaw AFB.





## **5.0 CUMULATIVE EFFECTS AND IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES**

### **5.1 CUMULATIVE EFFECTS**

#### **5.1.1 Definition of Cumulative Effects**

Cumulative effects are impacts that result from the incremental consequences of an action when added to other past and reasonably foreseeable future actions regardless of the agency (federal or non-federal) or person undertaking such actions. Cumulative impacts can result from individually minor but collectively significant actions taking place over a period of time (40 CFR 1508.7). The cumulative effects of an action may be undetectable when viewed in the individual context of direct and indirect impacts, but nonetheless can add to other disturbances and eventually lead to a measurable environmental change.

#### **5.1.2 Past, Present, and Reasonably Foreseeable Actions**

Shaw AFB has been an active military installation since its establishment in 1941. It has subsequently undergone continuous development as its missions and operational requirements have evolved. Past actions during the historical development and operation of the base have created the environment in which either the Proposed Action or the No-Action Alternative would occur.

Present actions on Shaw AFB involve ongoing operational activities, maintenance of existing facilities, and construction of new facilities. These actions would continue under the No-Action Alternative, and any environmental impacts associated with these actions also would continue. Under the Proposed Action Alternative, the implementation of the WINDO projects would result in limited environmental impacts as described in Section 4, and these impacts would be in addition to the limited impacts from other current projects under construction on the base.

Five major projects currently planned or underway at Shaw AFB potentially could have cumulative impacts in conjunction with the Proposed Action and are described below.

- Construction of a Permanent Air Sovereignty Alert (PASA) Facility: The PASA Facility is planned for a location in the crosswind runway area near the southern perimeter of the base and approximately one mile from the nearest WINDO project.
- Construction of a new Readiness Complex: Three facilities are planned to comprise the new Readiness Complex, including a Disaster Preparedness Facility (5,370 SF), Mobility Storage Warehouse (6,700 SF), and an Airfield Pavement Training Area (4.6 acres). The Readiness Complex location is southeast of the runway and more than one mile west of the nearest WINDO project.
- Privatization of military family housing: On-base military housing (1,702 units) would be conveyed to a private contractor, who would conduct renovation,

demolition, and construction over a seven-year period, resulting in a total of 1,447 housing units. The only WINDO projects within base housing areas are the dormitory parking project (H11) and the construction of a permanent gate at the Palmetto Heights housing area (H7).

- Repair of the base perimeter fenceline and construction of a perimeter patrol road: This project would have a linear footprint along the perimeter fenceline of the base and would include clearing vegetation from a buffer along the fence, posting of warning signs, and construction of a perimeter road for security patrols. The only WINDO projects on the base perimeter are those associated with the entrance gates.
- Construction of an extension to the Shaw AFB WWTP sewer line outfall from its existing discharge into Beech Creek to a new location on the Wateree River. This project would allow the base to meet current discharge limits for copper due to the higher flow of the receiving stream. The sewer line project would be located west of the base perimeter with its origin at the current Beech Creek outfall, approximately 3,000 feet west of the nearest WINDO project.

Given the localized nature of construction-related impacts and the distance between project sites, there would not be significant, cumulative, construction-related impacts from the Proposed Action and any of the other four projects. In addition, neither the Proposed Action nor any of the four projects would individually have significant long-term impacts on any of the environmental resources at Shaw AFB. Given that the context and intensity of the effects of these projects individually are not predicted to approach the threshold of a significant impact, their cumulative effects similarly are not expected to be significant.

Reasonably foreseeable future actions on Shaw AFB under either the Proposed Action or the No-Action Alternative are expected to include continued maintenance of facilities, demolition of unneeded facilities, and construction of new facilities. Numerous projects have been identified as being needed and are programmed for future implementation, including WINDO projects in addition to those included in the Proposed Action and projects on the Shaw AFB Facility Board List.

#### 5.1.3 Analysis of Cumulative Impacts

The WINDO was developed to improve the facility planning process. The WINDO links the base General Plan to funding sources while ensuring that the Wing Commander, base, and ACC have a common set of infrastructure goals and priorities. Evaluating the impact of a group of WINDO projects in one EA streamlines the NEPA process, reduces project fractionation, enables tiering of projects, coordinates land use planning, and facilitates the analysis of cumulative impacts from those and other projects. Assessing multiple projects as one Proposed Action promotes the consideration of cumulative impacts from the implementation, maintenance, and operation of those facilities throughout the evaluation of consequences for each resource considered in the EA.

The majority of the projects proposed as part of the WINDO involve replacement, enhancement, or expansion of existing facilities. Cumulative effects resulting from these proposed projects in conjunction with other past, present, and foreseeable future projects not included in the Proposed Action are anticipated to be minimal for all environmental resources. Cumulative effects from the projects included in the Proposed Action as well as ongoing operations and maintenance on the base were considered in the evaluations of consequences for each resource in Chapter 4. Accordingly, it is expected that cumulative adverse impacts would not be significant.

## 5.2 IRREVERSIBLE AND IRRETRIEVABLE COMMITMENT OF RESOURCES

Irreversible commitments of resources are those that essentially cannot be reversed, such as the extinction of a species or the consumption of fossil fuels. Irretrievable commitments of resources are those that are lost for a period of time, but that may be recoverable over the long term, such as the cutting of a pine plantation.

In that they assume the continuation of Shaw AFB, its missions, and associated operations, irreversible and irretrievable commitments of resources would be similar under the Proposed Action and the No-Action Alternative. Both would result in the irreversible commitment of certain natural resources; for example, timber and minerals for construction, natural gas for heating, and petroleum for aircraft fuel, automobile fuel, and heating. Both would also involve irretrievable commitments of natural resources as a result of the displacement of natural habitats, wildlife, and ecosystems that occurred during the initial establishment of the base and its ongoing development.

Under the Proposed Action, implementation of the proposed projects would involve additional irreversible and irretrievable commitments of natural resources, labor, materials, and fiscal resources beyond those that would occur under the No-Action Alternative. In areas of construction and paving, the land would be converted from its current uses to uses such as buildings, parking lots, and roadways. However, these areas are small in extent. Most of the projects included in the Proposed Action are alterations or additions to existing structures or are new construction sited in areas that are already highly developed, thus minimizing irreversible and irretrievable commitments of natural resources. Use of the land under these facilities would be an irreversible commitment until or unless at some future time the structure is demolished (e.g., if a greater need for use of the land arises).

Labor and materials, such as fossil fuels and building materials, would be expended during implementation of the Proposed Action. Additionally, labor and natural resources would be used in the fabrication and preparation of construction materials. These resources generally would not be retrievable. However, these resources are not in short supply, and their commitment to the Proposed Action would not have an adverse effect on their availability. Fiscal resources also would be committed, as each proposed project also would require an irretrievable, one-time expenditure of federal funds.



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## 7.0 LIST OF PREPARERS

### **Beth Behr**

*Shaw AFB EA Project Manager*

BS, Environmental Science, University of Florida

1 year experience

### **Gil N. Burnet, PE**

*Project Manager*

MCE, Sanitary Engineering, North Carolina State University

BS, Civil Engineering, North Carolina State University

35 years experience

### **Susan Provenzano, AICP**

*Principal Author for the EA; Project Scientist for Land Use and Infrastructure*

MS, Marine Environmental Science, State University of New York at Stony Brook

BA, Earth and Space Science, State University of New York at Stony Brook

25 years experience

### **Stephen Dillard**

*Principal Author for the EA; Project Scientist for Biological, Cultural, and Water Resources*

MS, Environmental Systems Engineering, Clemson University

BS, Zoology, Clemson University

14 years experience

### **Kathleen Garvin**

*Project Scientist for Land Use, Water Resources, Cultural Resources*

MS, Environmental Resource Management, University of South Carolina

BS, Biological Sciences, Clemson University

5 years experience

### **Gretchen Jameson**

*Project Scientist for Infrastructure*

MS, Plant and Environmental Sciences, Clemson University

BSE, Biomedical Engineering, The University of Iowa

7 years experience

### **Ronald G. Johnson**

*Project Scientist for Socioeconomic Analysis, Hazardous Material and Waste Management, Noise, Environmental Justice*

MS, Biological Sciences, Illinois State University

BA, Biology, Knox College

21 years experience



**Mark Johnston**

*GIS Research, CADD, Figure Compilation*

AS, Construction Technology, Community College of the Air Force, Edwards AFB, CA  
14 years experience

**John C. Schrohenloher, PE**

*Project Scientist for Air Quality and Noise*

BS, Civil Engineering, University of Alabama, Tuscaloosa  
14 years experience

**Elizabeth Steffens, EIT**

*Project Scientist for Safety*

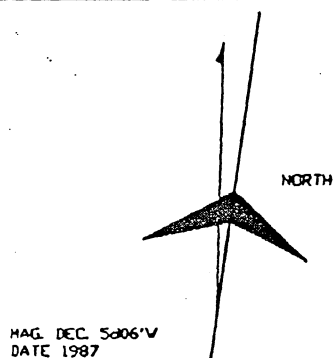
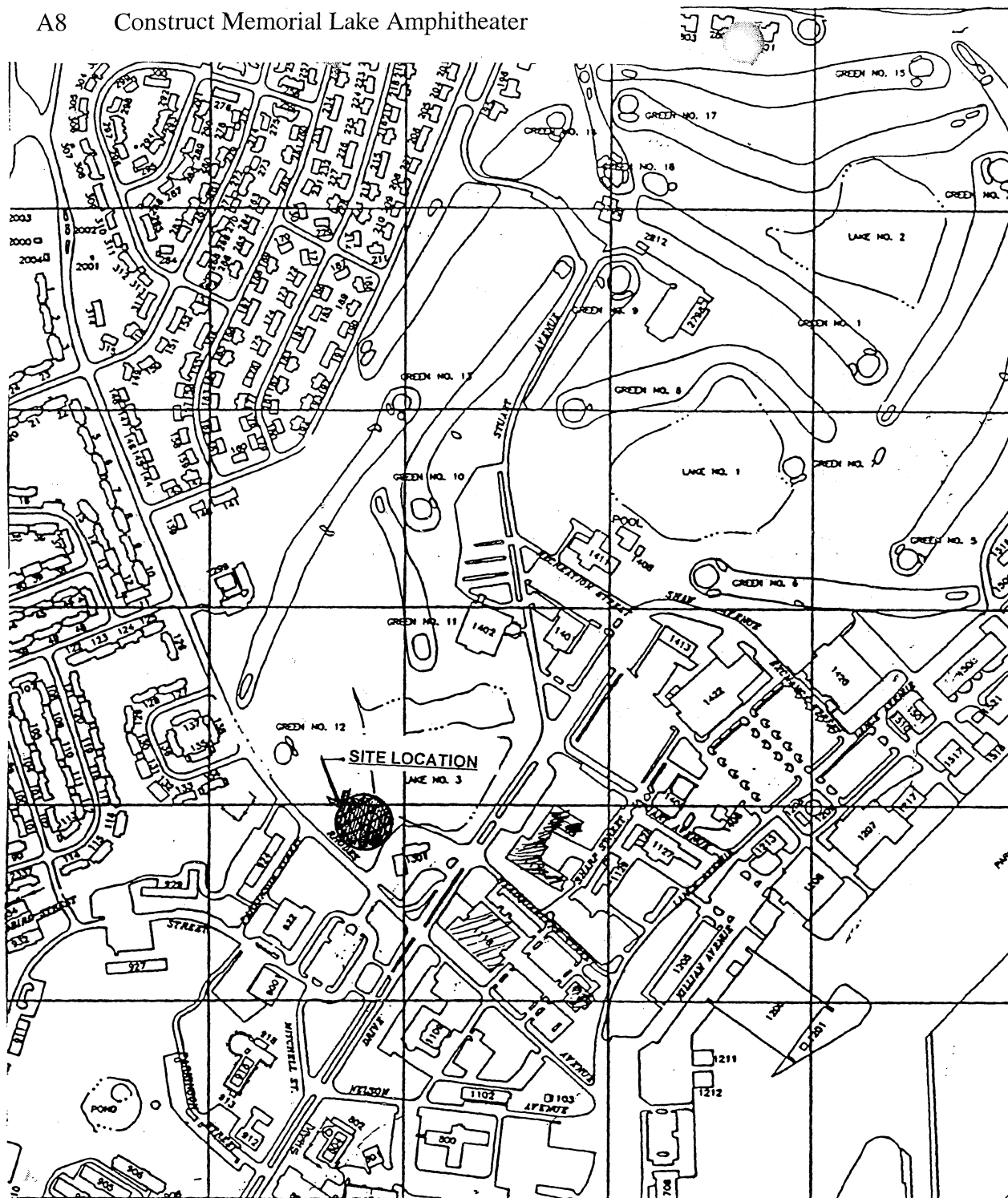
BS, Mining Engineering (Environmental Health and Safety minor), Pennsylvania State University  
4 years experience

**Kilmeny Stephens**

*GIS Analysis, Figure Compilation*

BSc, Geology, Victoria University of Wellington, New Zealand; BSc (Hons) Geology, Victoria University of Wellington, New Zealand  
15 years experience

**APPENDIX A**  
**PROJECT SITE PLANS**



MAG. DEC. 5006'V  
DATE 1987

DEPARTMENT OF THE AIR FORCE

SITE LOCATION MAP (FOR EIA /813)  
CONSTRUCT NEW AMPHITHEATER  
MEMORIAL LAKE

SHAW AIR FORCE BASE  
SUMTER, SOUTH CAROLINA

SCALE: 1 INCH = 600 FEET

DATE: 26 OCT 1996

## 1. COMPONENT

**AF(ACC)**

## FY 2006 MILITARY CONSTRUCTION PROJECT DATA

2. DATE

**26-May-04**

### 3. INSTALLATION AND LOCATION

## Shaw Air Force Base, South Carolina

#### 4. PROJECT TITLE

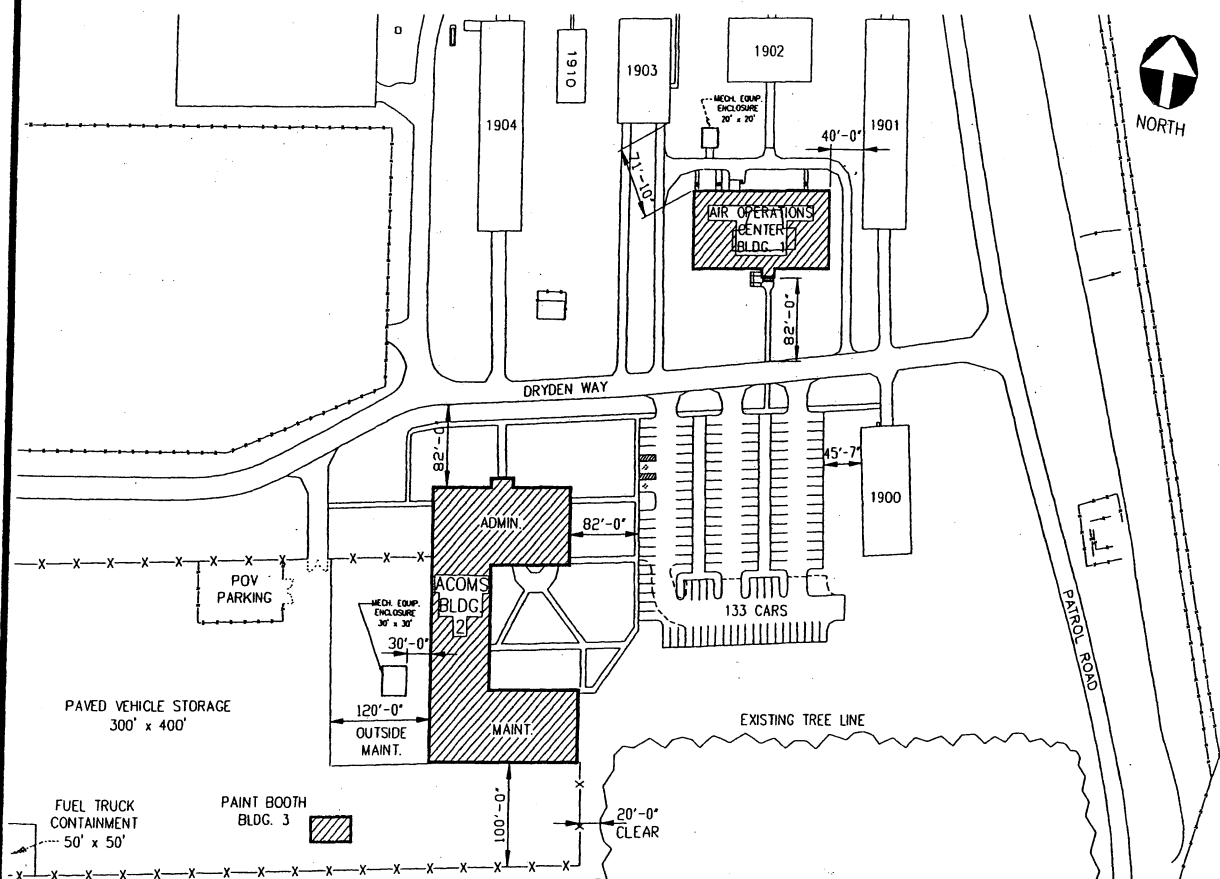
## USCENTAF COMMUNICATIONS SQUADRON FACILITY

4.	PROJECT NUMBER
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**VLSB 98-3002**

## LOCATION PLAN

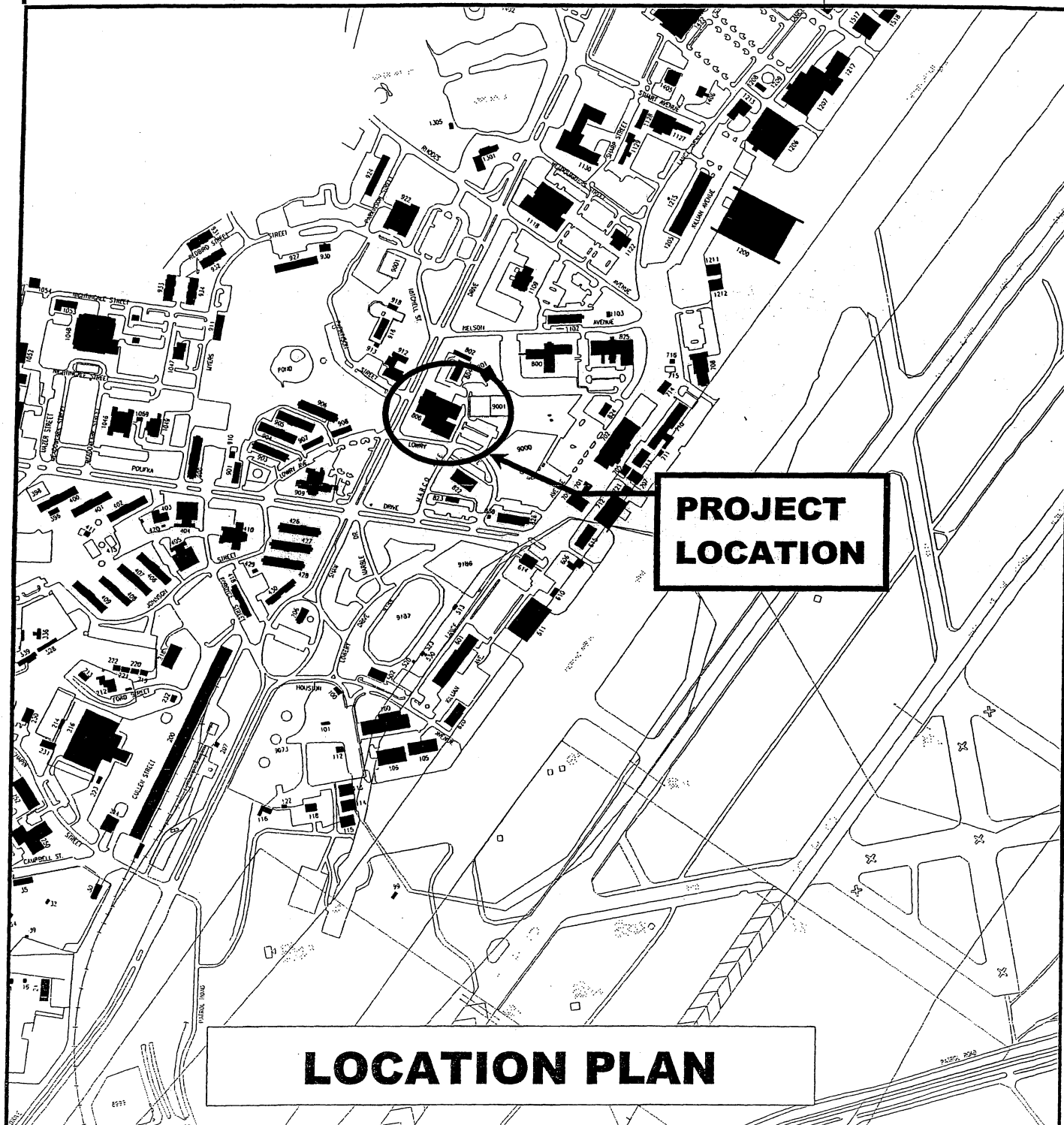
1. COMPONENT AF (ACC)	FY 2006 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 26 May 04
3. INSTALLATION AND LOCATION SHAW AIR FORCE BASE, SOUTH CAROLINA		
4. PROJECT TITLE USCENTAF COMMUNICATIONS SQUADRON FACILITY		5. PROJECT NUMBER VLSB 98-3002R3



# SITE PLAN



1. COMPONENT AF (ACC)	FY 2006 MILITARY CONSTRUCTION PROJECT DATA	2. DATE 26 May 04
3. INSTALLATION AND LOCATION SHAW AIR FORCE BASE, SOUTH CAROLINA		
4. PROJECT TITLE ADD/ALTER FITNESS CENTER		5. PROJECT NUMBER VL5B 043001R1

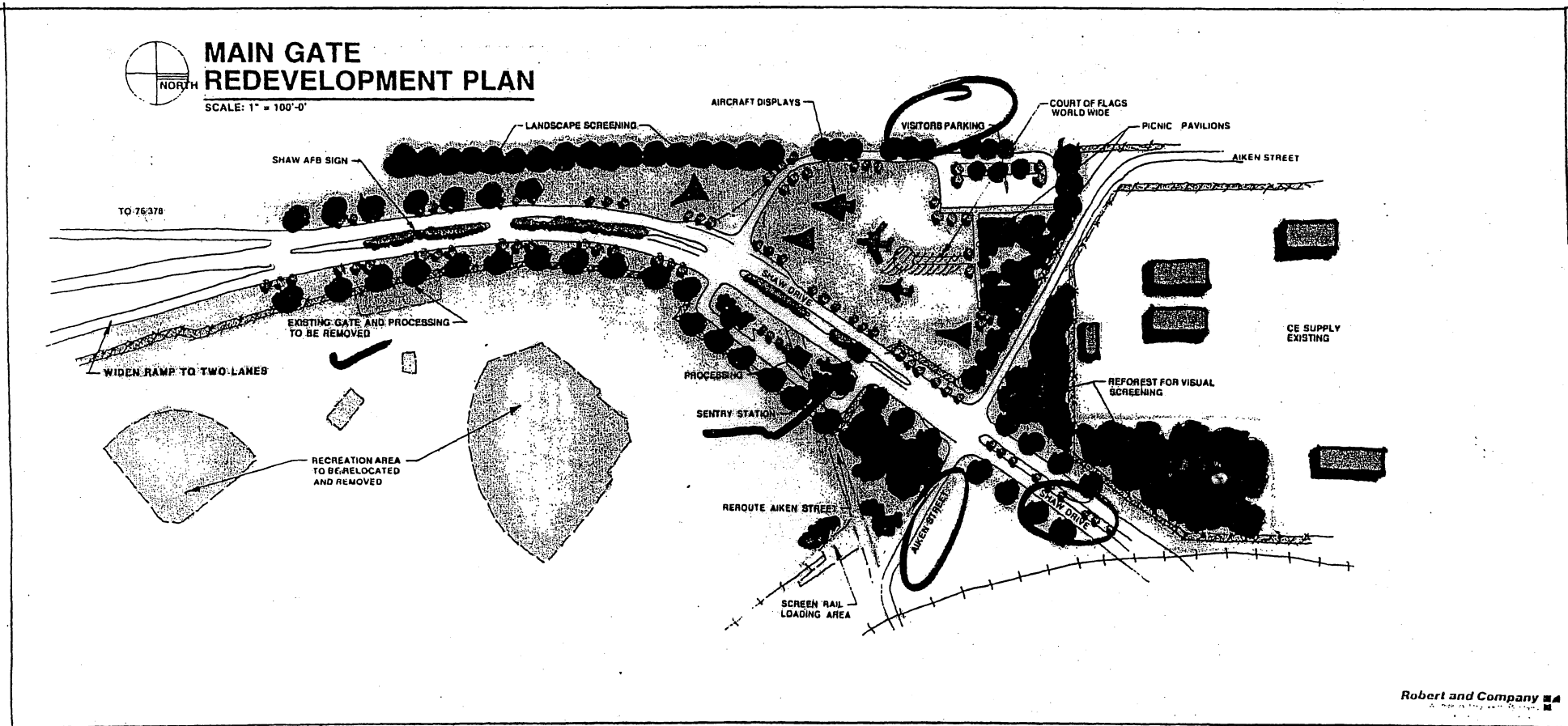


<b>1. COMPONENT</b> <b>AIR FORCE</b>	<b>FY 2006 MILITARY CONSTRUCTION PROJECT DATA</b>	<b>2. DATE</b> 24 JULY 03
<b>3. INSTALLATION AND LOCATION</b> SHAW AIR FORCE BASE , SOUTH CAROLINA		
<b>4. PROJECT TITLE</b> ADD/ALTER FITNESS CENTER	<b>7. PROJECT NUMBER</b> VLSB 04-3001R1	

**ADDITIONS**

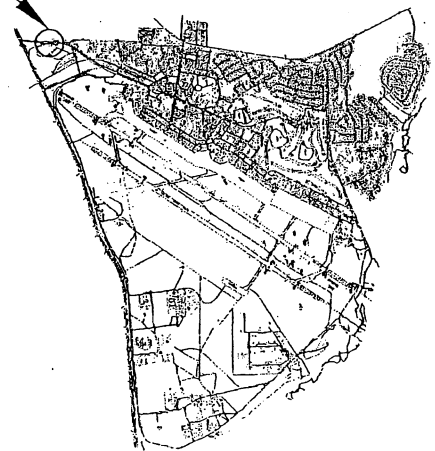
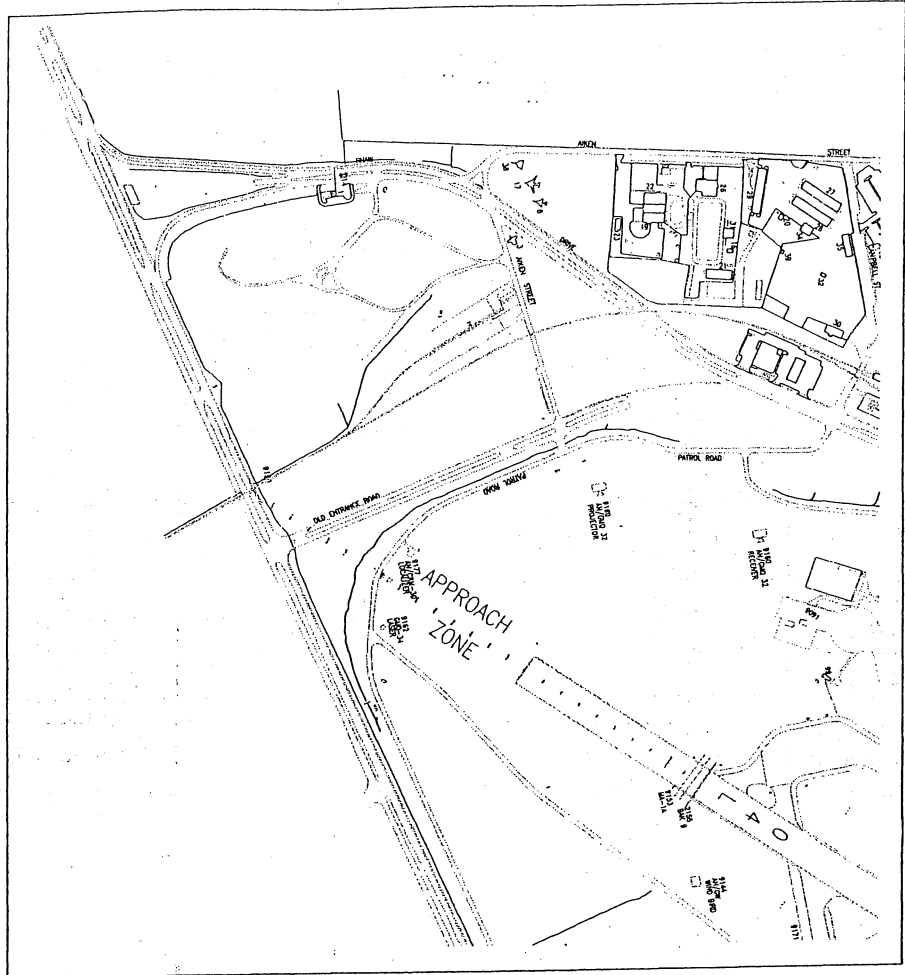
**EXISTING**

**SITE PLAN**



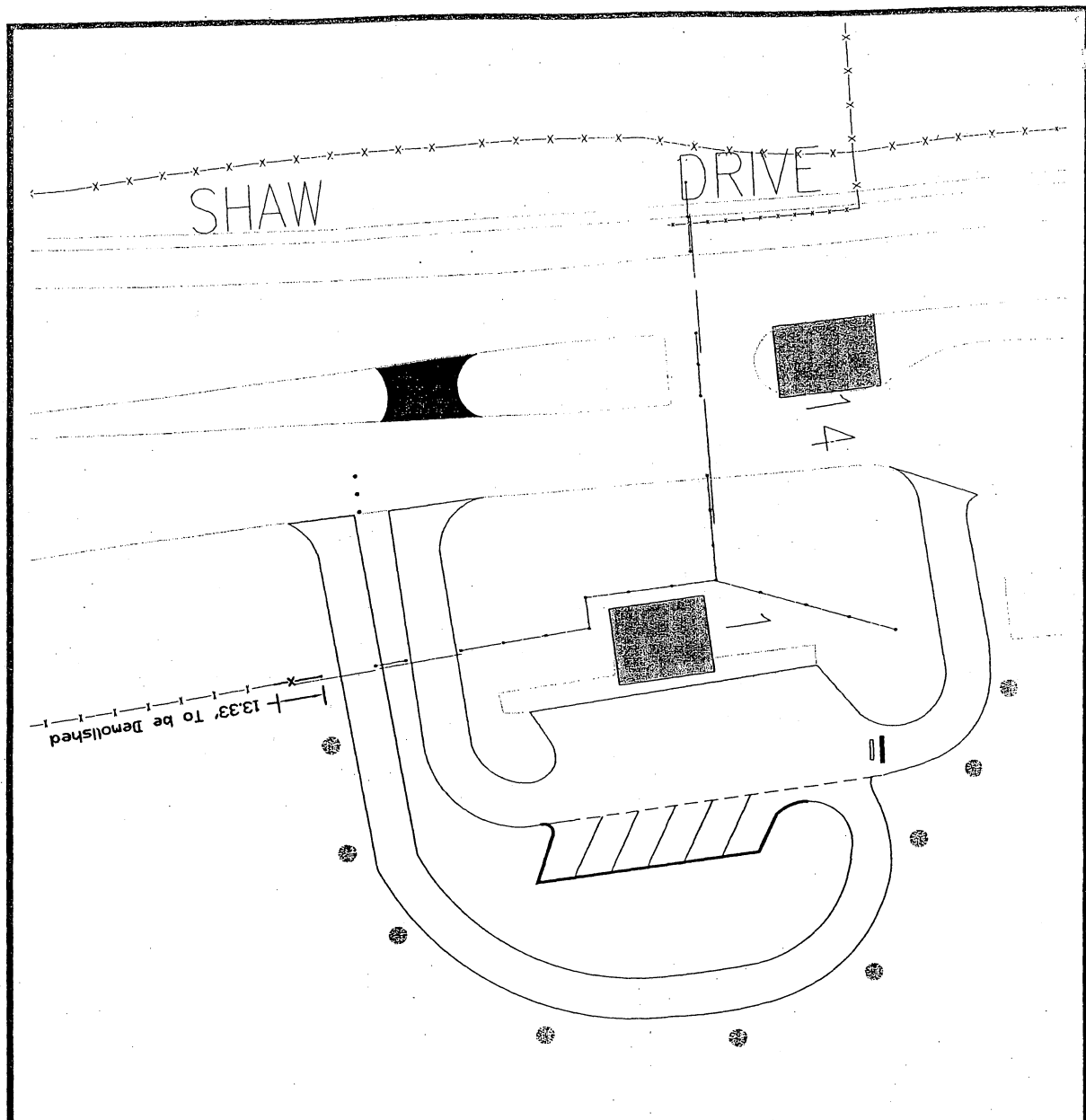
H3 Construct Main Gate

INSTALL FENCE FRONT GATE - BLOCKWALL  
SHAW AIR FORCE BASE, SOUTH CAROLINA  
LOCALITY MAP



INDEX of DRAWINGS	
Description	Sheet Number
This Sheet	1-01
Existing Site Plan	5-01
Final Site Plan	5-02
Detail	5-03

040055T01 SHEET 1 OF 4	DRAWN BY: DMS DATE: 8/4/07/2004	INSTALL FENCE FRONT GATE - BLOCKWALL TITLE SHEET		ALL CITIES ENTERPRISES 319 Avocet Street Shaw AFB, SC 29152	ALL CITIES APPROVAL SIGNATURE _____ DATE _____
		VLSB 04-0055			DATE: 4/8/07 CONTRACTOR SIGNATURE: <i>Larry M. Wells</i> DATE: _____



# NOTES

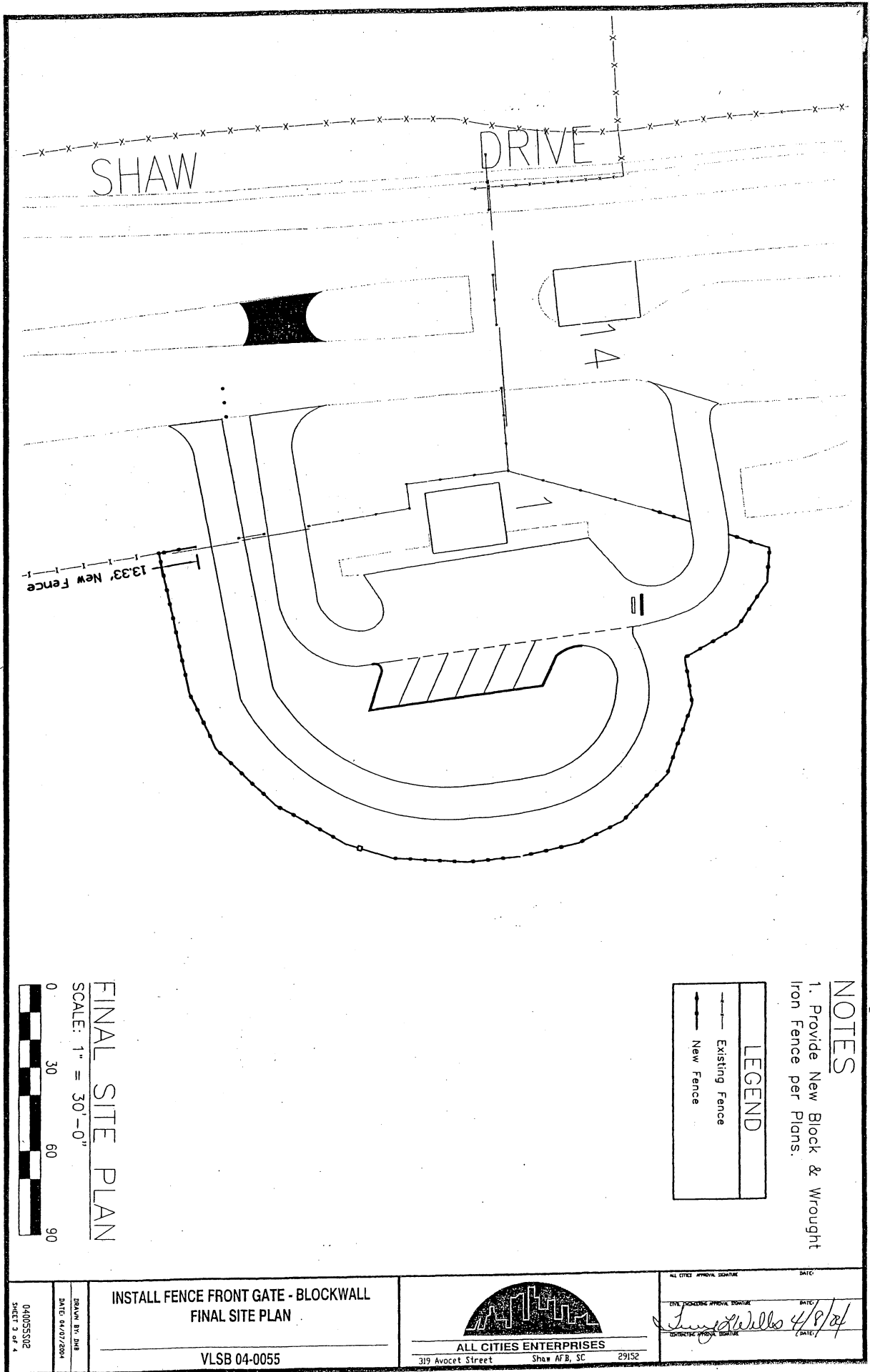
1. Remove 9 Existing Trees.
2. Demolish 13.33 LF of Existing Chain Link Fence.

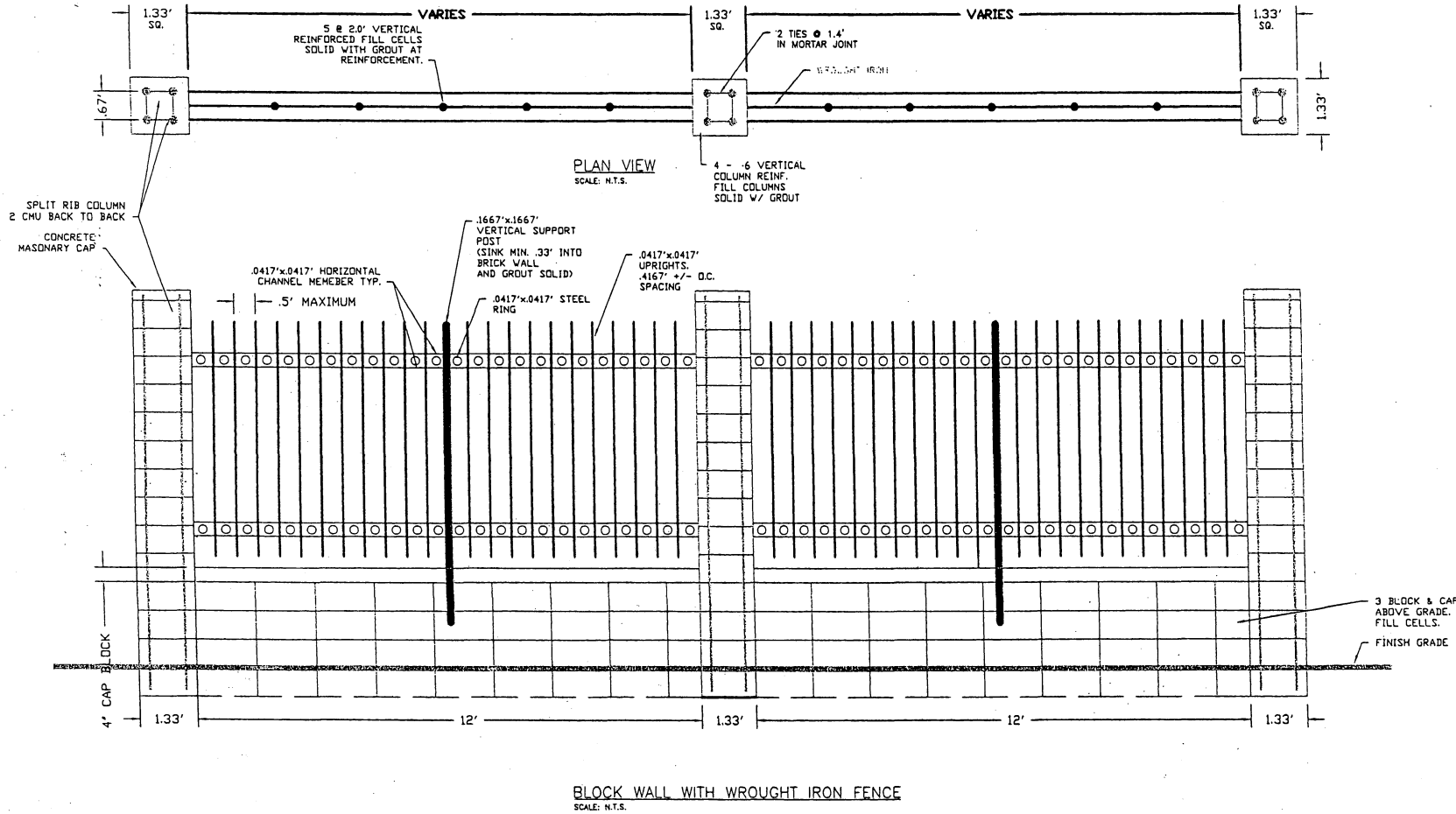
LEGEND	
	Existing Chain Link Fence
	Existing Wrought Iron Fence
	Removed Trees
	Fence to be Demolished

EXISTING SITE PLAN  
SCALE: 1" = 30'-0"  
0 30 60 90

<b>INSTALL FENCE FRONT GATE - BLOCKWALL</b> <b>EXISTING SITE PLAN</b>  VLSB 04-0055		 <b>ALL CITIES ENTERPRISES</b> 319 Avocet Street      Shaw AFB, SC      29152		<small>ALL CITIES APPROVAL SIGNATURE</small> <small>DATE</small> <i>[Signature]</i> 4/8/04
<small>DRAWN BY: DHE</small> <small>DATE: 04/07/2004</small> <small>040055S01</small> <small>SHEET 2 OF 4</small>				







ALL CITY ENTERPRISES, INC.

DATE: 04/07/2004  
DRAWN BY: DMB



ALL CITIES ENTERPRISES, INC.  
319 A Street Street  
State AFB, SC 29152

INSTALL FENCE FRONT GATE - BLOCKWALL  
DETAIL SHEET

VLSB 04-0055

DRAWN BY: DMB  
DATE: 04/07/2004

040055503  
SHEET 4 of 4

H4 Install Fence at New Main Gate

**APPENDIX B**  
**AGENCY COORDINATION**

## **CONSULTATION LETTERS**





## DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Mr. Phil Degarmo  
U.S. Fish and Wildlife Service Ecological Field Office  
176 Croghan Spur Road, Suite 200  
Charleston, SC 29407-7558

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development  
Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

This letter has been sent to you in accordance with the scoping process required by the Council on Environmental Quality regulations implementing the National Environmental Policy Act and for the purpose of interagency and intergovernmental coordination and notification for environmental planning. The United States Air Force invites you to review the attached copy of the EA and FONSI and provide any comments and concerns you may have regarding this Proposed Action.

Please transmit any comments to the EA Project Manager, Ms. Beth Behr, at the above address, at (803) 895-9988, or at [beth.behr@shaw.af.mil](mailto:beth.behr@shaw.af.mil). We request that comments be submitted by 17 September 2004 in order for any needed changes to be included in the Final EA.

Thank you for your consideration.

A handwritten signature in cursive script, reading "R. Marshall Dixon", is positioned above the printed name.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



## DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Mr. Sam Hamilton  
U.S. Fish and Wildlife Regional Office  
1875 Century Blvd  
Atlanta, GA 30345

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

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Thank you for your consideration.

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R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Ms. Jean Manheimer  
South Carolina State Clearinghouse  
Office of State Budget  
1201 Main Street, Suite 950  
Columbia, SC 29201

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development  
Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

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Thank you for your consideration.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



# DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Ms. Valerie Marcil  
South Carolina State Historic Preservation Office  
8301 Parklane Rd  
Columbia, SC 29223

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

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Thank you for your consideration.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



## DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Ms. Julie Holling, Data Manager  
South Carolina Department of Natural Resources  
P.O. Box 167, Rembert C. Dennis Building  
Columbia, SC 29202

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development  
Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

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R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*





## DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)

SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: South Carolina Department of Health  
and Environmental Control  
2600 Bull Street  
Columbia, SC 29201

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development  
Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

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Thank you for your consideration.

A handwritten signature in cursive script, reading "R. Marshall Dixon", is positioned above the printed name and title.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



# DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Honorable Joseph T. McElveen, Mayor  
City of Sumter  
P.O. Box 1449  
Sumter, SC 29251-1449

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development  
Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

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Thank you for your consideration.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



# DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Ms. Naomi Sanders, Chairwoman  
Sumter County Council  
13 East Canal Street  
Sumter, SC 29150

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development  
Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

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Please transmit any comments to the EA Project Manager, Ms. Beth Behr, at the above address, at (803) 895-9988, or at [beth.behr@shaw.af.mil](mailto:beth.behr@shaw.af.mil). We request that comments be submitted by 17 September 2004 in order for any needed changes to be included in the Final EA.

Thank you for your consideration.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



# DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Mr. Gilbert Blue  
Catawba Indian Tribe  
P.O. Box 188  
Catawba, SC 29704

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

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Thank you for your consideration.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



## DEPARTMENT OF THE AIR FORCE

20th FIGHTER WING (ACC)  
SHAW AIR FORCE BASE, SOUTH CAROLINA

AUG 18 2004

MEMORANDUM FOR: Ms. Faith A. Line, Director  
Sumter County Library  
111 North Harvin Street  
Sumter, SC 29150-4688

FROM: 20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

SUBJECT: Environmental Assessment (EA) for the Wing Infrastructure Development  
Outlook (WINDO) Plan at Shaw Air Force Base (AFB), South Carolina

The 20th Fighter Wing at Shaw AFB has prepared a Draft EA that evaluates the potential environmental impacts from a Proposed Action consisting of the construction of 17 projects included in the WINDO Plan for Shaw AFB. Based on the results of the EA, a Finding of No Significant Impact (FONSI) was prepared.

This letter has been sent to you as part of the public comment process. The United States Air Force requests that you make the attached copy of the EA and FONSI available at your library for review by the interested public. A public notice has been published in the 15 August 2004 edition of the Sumter Daily Item newspaper stating that a copy of the EA and FONSI will be available 18 August 2004 at your library and identifying how the public can comment. We request that you make the EA and FONSI available to the public through 17 September 2004.

Please contact the EA Project Manager, Ms. Beth Behr, at the above address, at (803) 895-9988, or at [beth.behr@shaw.af.mil](mailto:beth.behr@shaw.af.mil) with any questions.

Thank you for your assistance.

R. MARSHALL DIXON  
Environmental Flight Chief

Attachment:

1. Draft WINDO Plan EA

*Global Power For America*



**AGENCY COMMENTS ON DRAFT EA**



# United States Department of the Interior

**FISH AND WILDLIFE SERVICE**  
176 Croghan Spur Road, Suite 200  
Charleston, South Carolina 29407

September 3, 2004

Ms. Beth Behr  
20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

Re: Environmental Assessment for WINDO  
FWS Log No. 4-6-04-480

Dear Ms. Behr:

The U.S. Fish and Wildlife Service (USFWS) has reviewed the plans for this proposed project. Based on our review and the information received:

- ☐ We concur with your determination that the proposed action will have no effect on resources under the jurisdiction of the USFWS that are currently protected by the Endangered Species Act of 1973, as amended (16 U.S.C. 1531 et seq.)(Act). Therefore, no further action is required under Section 7(a)(2) of the Act.
- ☐ We concur with your determination that the proposed action is not likely to adversely affect resources under the jurisdiction of the USFWS that are currently protected by the Act. Therefore, no further action is required under Section 7(a)(2) of the Act.
- ☒ It is our opinion that the proposed action is not likely to have reasonably foreseeable adverse effects on resources under the jurisdiction of the USFWS that are currently protected by the Act. Therefore, no further action is required under Section 7(a)(2) of the Act.
- ☐ The proposed project may impact wetlands. Please contact the U.S. Army Corps of Engineers, Charleston District for more information.

If you should have any questions, please contact Lora Zimmerman at (843)727-4707, ext. 23 and reference FWS Log No. 4-6-04-480

Sincerely,

Edwin M. EuDaly  
Field Supervisor

Acting



September 15, 2004

Ms. Beth Behr  
EA Project Manager  
20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152-5123

RE: Draft Environmental Assessment, Wing Infrastructure Development Outlook  
(WINDO), FONSI, Shaw AFB

Dear Ms. Behr:

I have reviewed the above referenced Draft Environmental Assessment (EA) and related FONSI. I concur that there will be no effect to cultural resources by the project as proposed.

These comments are being provided to assist you with your responsibilities under Section 106 of the National Historic Preservation Act, as amended. I can be contacted at (803) 896-6173 if you have any questions or comments regarding this matter.

Sincerely,

Valerie Marcil  
Staff Archaeologist  
State Historic Preservation Office



September 3, 2004

Dept. of the Air Force  
20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152  
Attn: Beth Behr

Re: Comments Regarding the Environmental Assessment (EA) for the Wing  
Infrastructure Development Outlook (WINDO) Plan at Shaw AFB

Dear Ms. Behr:

The South Carolina Department of Health and Environmental Control's Bureau of Water administers applicable regulations pertaining to water quality standards and classifications, including wetland protection, in accordance with the South Carolina Pollution Control Act, the Federal Clean Water Act, the State Stormwater Management and Sediment Reduction Act, and associated regulations for all of these statutes.

To ensure protection and maintenance of water quality standards and classified uses, including wetlands functions, the Department recommends the following issues be addressed when planning and constructing this project:

1. Any placement of fill material in waters of the state, including jurisdictional wetlands will require a Department administered Section 401 Certification and an Army Corps of Engineers administered Section 404 Permit. When evaluating applications for fill in wetlands, demonstration of avoidance of wetland impacts, minimization of wetland impacts and mitigation of unavoidable wetland impacts provides assurances that impacts have been reduced to the extent possible and that water quality standards will be maintained. Documentation of these measures will be required.
2. A Navigable Waters Permit will also be required for all construction within navigable waters of South Carolina.
3. Any point source discharge into a stream or river will require a Department administered National Pollution Discharge Elimination System (NPDES) Permit.

Shaw AFB  
September 3, 2004  
Page 2

4. Any non-point discharges into a stream or river from construction areas exceeding 1 acre will require a Department administered Stormwater Management and Sediment Reduction Permit or an NPDES Stormwater Permit. All project involving sewer projects must be consistent with Water Quality Management Planning, Section 208 of the Clean Water Act.
5. Plans for installation of the water lines must be submitted to SCDHEC, Division of Water Supply Construction for review and approval prior to installation.

Other regulations not administered by this Bureau may apply to your project. Thank you for the opportunity to comment on this project. Please call Amanda Avildsen at (803) 898-3820 if you have any questions.

Sincerely,

  
M. Rheta Geddings, Director  
Division of Water Quality

MRG: AAA



STATE OF SOUTH CAROLINA  
*State Budget and Control Board*  
OFFICE OF STATE BUDGET

MARK SANFORD, CHAIRMAN  
GOVERNOR

GRADY L. PATTERSON, JR.  
STATE TREASURER

RICHARD ECKSTROM  
COMPTROLLER GENERAL



HUGH K. LEATHERMAN, SR.  
CHAIRMAN, SENATE FINANCE COMMITTEE

ROBERT W. HARRELL, JR.  
CHAIRMAN, WAYS AND MEANS COMMITTEE

FRANK W. FUSCO  
EXECUTIVE DIRECTOR

1201 Main Street, Suite 950  
COLUMBIA, SOUTH CAROLINA 29201  
(803) 734-2280

LES BOLES  
DIRECTOR

September 13, 2004

R. Marshall Dixon  
Department of the Air Force  
20th Fighter Wing (ACC)  
20 CES/CEV  
345 Cullen Street  
Shaw AFB, SC 29152

Project Name: Environmental Assessment for the Wing Infrastructure Dev. Outlook (WINDO)  
Plan at Shaw Air Force Base (AFB), SC

State Application Identifier: SC040803-2

Dear Mr. Dixon:

The State Clearinghouse, Office of State Budget, has conducted an intergovernmental review of the project referenced above as provided by Presidential Executive Order 12372. All comments received, if any, as a result of the review are enclosed for your information.

The Clearinghouse does not have information on the Federal agency's review status. Please contact your Federal grantor agency with any questions concerning the status of your application.

The State Application Identifier indicated above should be used in any future correspondence with this office.

Sincerely,

A handwritten signature in cursive script that reads "Jean Manheimer".

Jean Manheimer  
Fiscal Manager, Grant Services

## **APPENDIX C**

### **DISPERSION MODELING OF CONSTRUCTION-RELATED AIR EMISSIONS**

## Appendix C

### Dispersion Modeling of Construction-Related Air Emissions

#### Introduction

A simple dispersion model was used to provide an approximate measure of impact to the air shed over the base resulting from construction-related air emissions. The impact of construction emissions is expected to be small because of the relatively small size of the WINDO projects. Because internal combustion engines from construction equipment are the major source of emissions and the dispersion model is conservative, only internal combustion engine emissions were modeled.

The model is based upon events occurring within an atmospheric box as depicted in Figure 1.

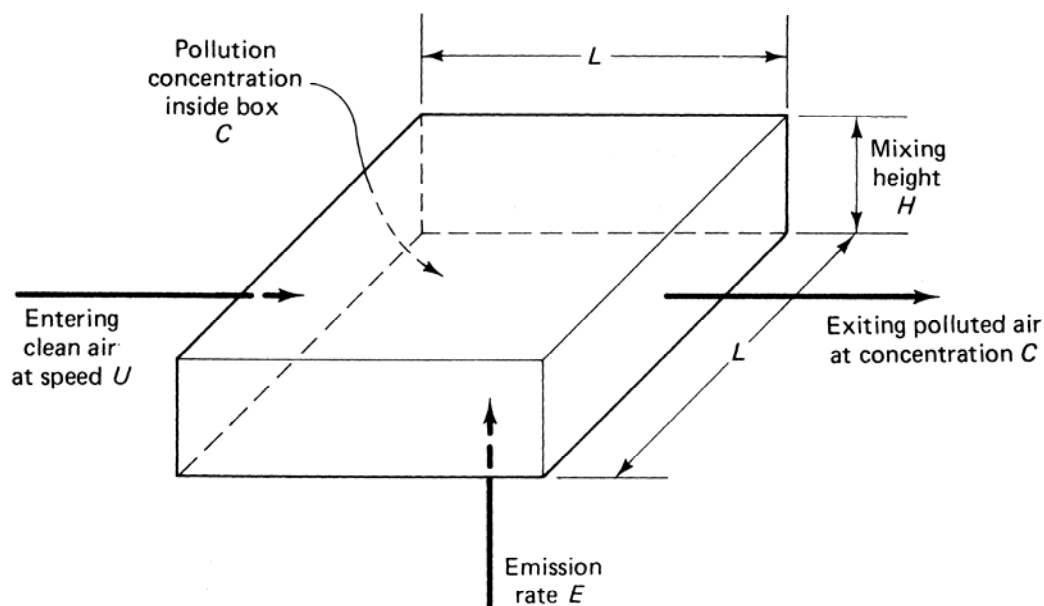


Figure 1: Dispersion Model Used in Air Quality Analysis

The box model may be used to estimate the concentration of air pollution within an atmospheric volume defined by a rectangular area  $L$  by  $L$  and a mixing height  $H$ . Pollutants are emitted into the box at a constant rate  $E$ . Clean air enters the box at a speed  $U$ . The basic equation of the model is:

$$C = \frac{E}{ULH}$$

## Meteorological Data

Wind speed and mixing height are needed for the model. Meteorological data were obtained from the USEPA Support Center for Regulatory Air Models (SCRAM) website (located at [www.epa.gov/scram001/tt24.htm](http://www.epa.gov/scram001/tt24.htm)). SCRAM Mixing Height Station 13723 in Greensboro, North Carolina, was selected as a representative location. (The only mixing height station available for South Carolina is located at Charleston. The Greensboro station, although it has less favorable meteorological conditions than those found at Shaw AFB, better represents conditions in the Shaw AFB area.) The average a.m. (i.e., morning) mixing height of approximately 400 meters and wind speed of 9,360 meters per hour were selected as representative worst case mixing height and wind speed.

## Box Geometry

A 20,000 by 20,000 meter square encloses the base. A mixing height of 400 meters was used.

## Compression Combustion Engines

The quantity, type, and size engines needed to be determined. It was assumed that the representative equivalent diesel engine would be a Tier 2 engine in the 100 to 175 horsepower class.

The quantity of engines was estimated by first estimating the maximum number of engines that would be running at the same time on each construction project; then assuming that, at most, a third of the projects would be maximizing engine use at the same time.

Emission factors listed in Table 1 were obtained from Tables 3, 4, 5, and 6 of *Exhaust and Crankcase Emission Factors for Nonroad Engine Modeling--Compression-Ignition*. EPA420-P-04-009, NR-009c, EPA, Revised April 2004.

**Table 1: Emission Factors**

Pollutant	Rate (g/hp-hr)
HC	0.3384
CO	0.8667
NO <sub>x</sub>	4.0
PM <sub>10</sub>	0.18

## Calculations

The basic equation is:

$$C = \frac{E}{ULH} = \frac{E}{(20,000)(400)(9,360)} = \frac{E}{74,880,000,000}$$

Pollutant	Emission Factor (g/hp-hr/engine)	times	Engine Horsepower (assumed 137 hp)	times	Number of Engines (assumed 12)	equals	E (g/hr)	C (mg/m <sup>3</sup> )
HC	0.3384	<i>x</i>	137	<i>x</i>	12	=	556.3	0.74e-8
CO	0.8667	<i>x</i>	137	<i>x</i>	12	=	1,425	1.90e-8
NO <sub>x</sub>	4.0	<i>x</i>	137	<i>x</i>	12	=	6,576	8.78e-8
PM <sub>10</sub>	0.18	<i>x</i>	137	<i>x</i>	12	=	296	0.95e-8